

THE AGILE ENTERPRISE

THE AGILE ENTERPRISE

*Reinventing your Organization for Success
in an On Demand World*

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Dedication

To the corporate sponsors of the eBusiness Research Center at the SMEAL College of Business at the Pennsylvania State University for their financial and material support, as well as their enthusiasm in publishing this book.

—Nirmal Pal

—Daniel C. Pantaleo

To my wife, Mitra, my daughters Neela and Nupur, and my grand children Nina and Nikhil for their sustaining love and support.

—Nirmal Pal

To my wife, Judy, and all of my children, Elizabeth, Sarah, Schotland, and Briannon, for their sustaining love and support and for the innovation and agility they each demonstrate in doing so.

—Daniel C Pantaleo

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Acknowledgments

Leading business publications, university and corporate studies, and anecdotal conversations with corporate leaders, make very clear that corporate agility will continue to dominate corporate thinking and drive business and technology decisions into the near and longer term future. The 21st century has brought with it an increase in the already rapid pace of change in all spheres of life and business. Successful enterprises are beginning to respond rapidly to these changes with business process innovations and using technology to support those innovations. *Agility* is competitive power and depends on the ability to successfully connect thought and action, theory and practice, and business and technology.

To fully understand the pervasive implications of agility in industry, government, and academia requires a wider collaboration among technologies, competencies, policies, and business models. That is precisely why we invited recognized thought leaders representing each of these segments to share their experiences and insights on the opportunities and challenges associated with corporate responsiveness and flexibility. All of them are well known in their respective fields of work, and they are all very busy individuals. Yet they made the time to address these issues because of the importance of agility. We are eternally grateful to our chapter authors and acknowledge their contributions.

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BUSINESS PROCESS AUTOMATION



A Framework for Combining Best and Next Practices for the Agile Organization

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INTRODUCTION

Agile enterprises must adapt to continually changing business environments in order to survive in the long term. To do so they have to combine best and next business practices. Best practices ensure efficiency; next practices really lead to competitive advantages.

Traditional business process automation solutions, like ERP, SCM, or CRM systems focus on the implementation of best practices. Next generation process automation enables the implementation of next practices at an economically acceptable cost level. This is possible through a flexible integration of business process definition and software application support. The appropriate software

support must be dynamically adaptable to the business processes definition so that it supports the execution of enterprise specific processes.

Business process models reflecting best and next practices drive the configuration of next generation process automation solutions which “orchestrate” the appropriate application support. They become the critical link between strategy and execution.

BUSINESS AGILITY THROUGH BEST AND NEXT PRACTICES

Enterprises have to innovate continuously in order to survive on the long term. It is not sufficient just to implement best business practices or to reduce cost. Best practices may ensure an efficient survival of the organization, but not real success. Real progress is made through innovation. Innovation is key in the agile organization. And innovation requires the vision, development, and execution of next business practices, resulting in new processes. Successful enterprises have to combine best and next practices to achieve business process excellence and with that competitive advantages (Scheer, Business Process Engineering, 2003).

Innovation requires next business practices

An enterprise can drive innovation in various ways. The key types of innovation are

- Product innovation
- Collaboration innovation
- Process innovation.

These types of innovation are interrelated and together comprise a continuously evolving business model. Each influences the others. Product innovation may also imply collaboration and process innovation and so on. The types of innovation and their interrelations are visualized in Figure 1.

The classic form of innovation is product innovation. The term product is here used in a wide sense including goods, services, rights, or any other offering that is sold on the market (Kirchmer, Market- and Product-Oriented Definition, 1999). Product innovation means that a new product is brought to the market or the features of an existing one are increased or improved. A new digital camera may have a better resolution and an easier integration with a PC, a car, an advanced

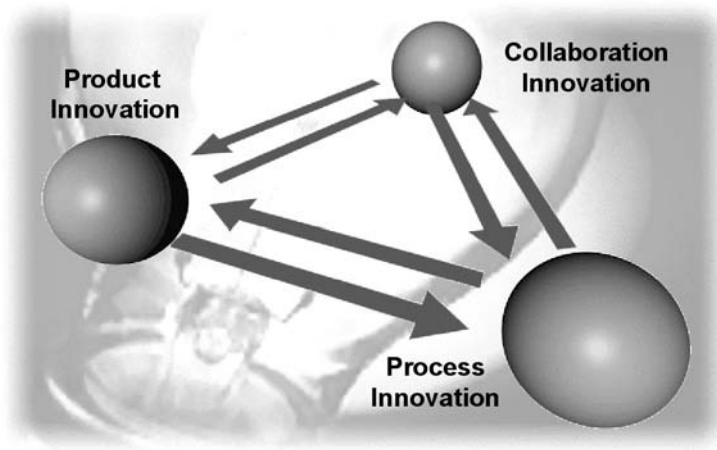


Figure 1. Types of Innovation

on-board computer, or a consulting company offers a new service solution focused on the Sarbanes-Oxley act.

Collaboration Innovation has become more and more important. Henry Chesbrough in his book, “Open Innovation—The New Imperative for Creating and Profiting from Technology” points to the increasing wisdom for collaboration with external partners to maintain corporate innovation in the face of increasingly complex challenges and business processes. New forms of collaboration result in competitive advantages, e.g. new offerings. An example for this type of innovation is the “On Star” services GM first offered in the Cadillac Escalade. Through On Star the driver can connect to a service office. There they locate the car, give directions or offer concierge services. The car itself was not really an innovation when it came to the market, but the combination with On Star was. This innovation was possible through a unique collaboration between a care company and a wireless network phone company. The collaboration innovation resulted in an enhanced offering, a product innovation.

The third type of innovation is process innovation. In this case innovation is driven through new or uniquely improved business processes. Companies like Dell, Amazon.com, or Ebay are built entirely on the basis of process innovation. Dell didn’t invent the PC, but a new process of bringing it to market; Amazon didn’t invent the book but a new way of selling it; and Ebay offers a new, unique way of participating in auctions. New processes lead in those cases to a new way of collaboration and new offerings. The availability of a new technology can also drive new or adapted business processes. As corporations explore and adopt RFID technology, for example, the knife-edge of competitive advantage in the market place may well depend on who first devises the most effective business process

model to incorporate the information available from this technology. It is not at all clear that companies have yet achieved high levels of ROI from the introduction of mobile technologies. From our perspective this failure by companies to exploit thus far the opportunities made possible through such technologies is due to the lack of business process research and analysis.

In general each type of innovation impacts the business processes in place. This is obvious in the case of process innovation. But also a new form of collaboration requires the appropriate new processes, in this case inter-enterprise processes. And new or modified products that have to be produced and brought to the market may result in new marketing, sales, production, or distribution processes. Those innovation driven processes are most likely to be unique when they are first implemented. Therefore they require next business practices since best practices are not available for those business processes. The agile organization has to be able to adopt next business process practices quickly and effectively.

Efficiency requires best business practices

However, innovation is not necessary in all areas of an organization. Otherwise the agile organization wouldn't be affordable. In contrary: many consulting research projects have shown that often 80% or more of the business processes of a company can be standardized based on industry best practices without any impact on the desired competitive advantages of an organization. This reduces cost and risk for implementation and management of those processes (Kirchmer, Brown, and Heinzl, 2002) (Kirchmer, 1999).

Typical examples for the use of such best practices are processes that are highly influenced by legal regulations, e.g. in the field of finance, accounting, or human resources administration. In general it wouldn't make sense to invent new processes in those areas; but also in areas that are widely recognized as important for creating competitive advantages, the implementation of best practice business processes can make sense. The distribution processes of a supply chain may be crucial and very unique for some pharmaceutical or consumer packaged goods companies. They may be less relevant for an enterprise in the capital goods industries. Here the use of best practices is the most efficient solution.

Industry organizations like the Supply Chain Council develop best practice reference models that allow the efficient and effective use of such business process standards. An example for such a reference model is shown in Figure 2. The SCOR reference model structures the supply chain processes on higher levels based on best practices, and leaves on the lowest description level the appropriate choice of a company specific execution of those processes, including the implementation of new processes.

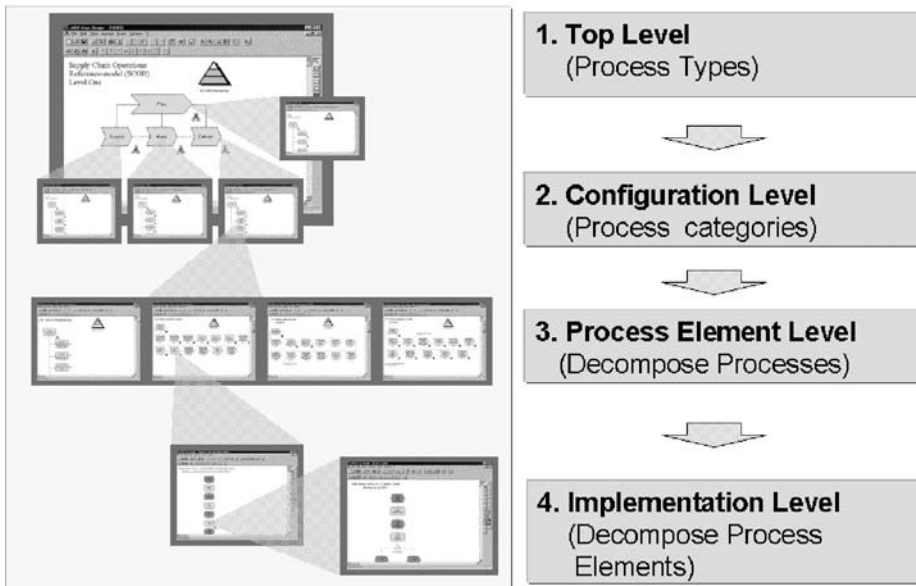


Figure 2. SCOR reference model—best practice model for the supply chain

The systematic use of such best practice models is key for an organization to efficiently reach the necessary process improvements in areas in which they do not need to achieve special competitive advantages. Here a company has to make sure to be at least as good as the competition and this with as little effort and additional resources as possible. To try to define next practices in those areas would lead to unnecessary cost and therefore even impact the business situation of an enterprise negatively. The efficient and effective application of best practices often becomes an important competitive advantage of the agile organization.

BUSINESS PROCESS AUTOMATION AS ENABLER

Best and next business practices have to be identified, combined, and then effectively implemented in the agile organization. This requires a systematic approach to business process lifecycle management. A framework that enables such an approach is the ARIS House of Business Process Excellence. It orchestrates the design, implementation, execution and control of business processes based on best and next practices.

However, the desired business results can finally only be fully achieved if the execution of the processes is successful. Widely used standard application software

solutions, like ERP, SCM, or CRM systems such as those provided by SAP support the execution of processes—but lead in general to the realization of best practice scenarios. The implementation of next practices requires flexibility in execution that up to now has not been available or only available at an unacceptable cost. As a result many processes are not or not sufficiently automated (Kalakota and Robinson, 2003), so that they cannot be executed and changed with the speed necessary in an agile organization. Results are reduced performance and productivity. Therefore the use of new business process automation technologies becomes crucial: They deliver the flexibility in the process execution necessary to implement new business process practices at an acceptable cost level.

Business process lifecycle management

An enterprise prepared to adapt to business processes *on the fly* can respond quickly to changing business environments, triggered through events like new or changing customers, suppliers, or other market partner requirements, new or modified market offerings, changing legal regulations, availability of new or improved technologies, outsourcing of specific activities, mergers and acquisitions, new business models, or cultural differences in various locations. Business process based organizations that practice business process lifecycle management gain a distinct advantage in the market over competitors who are not as responsive or agile. The prize is the ability to fulfill short-term needs and maintain long-term success.

Recent software advances permit the automated and responsive management of business process lifecycles. For example, the entire lifecycle of business processes can be managed based on the ARIS house of Business Process Excellence shown in Figure 3 (Scheer and Jost, 2002) (Kirchmer and Scheer, 2003), leading to a process centered organization. While specific to the ARIS software, this model allows us to examine the *process of process management*.

Business process management starts on the strategy level of an organization. Here a planned innovation is identified and the resulting business process structure and strategy as well as the business goals are defined. Processes that require next business practices in order to lead to competitive advantages are identified. Then the underlying application system architecture is worked out accordingly. The guideline for a process-centered organization is defined.

This guideline is passed from the strategy layer to the process specification layer. On this level the blueprint for the resulting business processes is specified, using techniques like simulation or ABC costing. Processes reflecting next practices are designed *de novo*. The specification of best-practice based processes

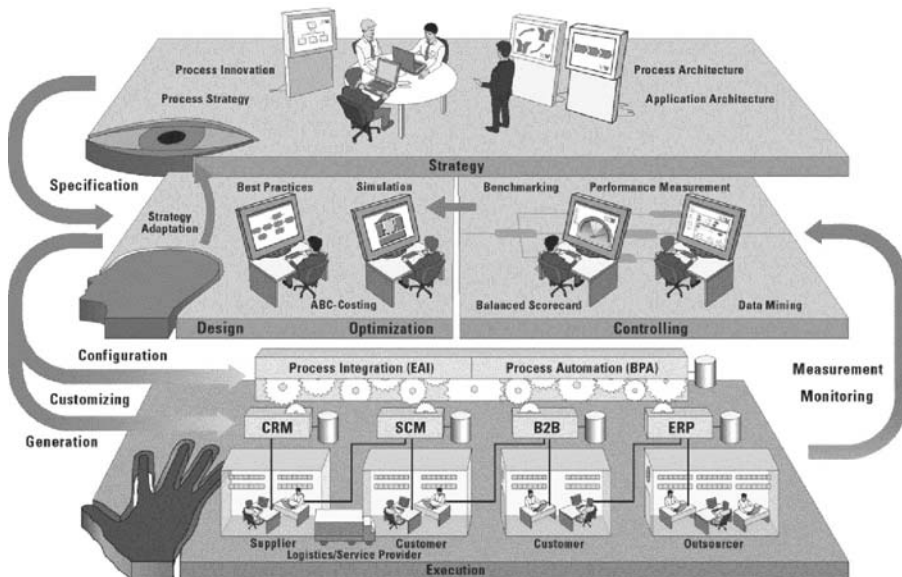


Figure 3. ARIS House of Business Process Excellence

can be supported by using the already mentioned reference models. On the specification layer all the necessary business processes are described in detailed so that this description can be used to drive the process execution. The result is a blueprint consisting of business process models.

Based on these process models the implementation of all physical and information processing activities is carried out, within and across enterprises. Here processes are either executed using standard application packages like ERP, SCM, or CRM systems that generally support best practice processes, or processes must be executed based on more flexible application solutions that can reflect necessary next practice approaches. These are next generation business process automation solutions.

The processes that are actually executed are measured and controlled on the so-called controlling level. If there are differences observed between planned key performance indicators (KPIs), defined based on the goals identified on the strategy level, and the actual values, either a continuous improvement process is initiated through the process specification layer or the situation is resolved on a strategic level, if the business environment has changed significantly.

All the design and specification as well as the controlling activities can be supported by business process management solutions like the ARIS Process Platform. These solutions also drive the process execution that may be based on traditional process automation or next generation process automation solutions.

Process automation based on standard applications

During the last ten to fifteen years, more and more business processes have been supported by standard software solutions including SAP ERP, SCM, or CRM systems (Kirchmer, 1999). This has numerous advantages compared to individually developed software systems. A key advantage of these traditional process automation solutions is that they do not only deliver a technology to execute a specific process. Standard software also supplies best business practices, included in the software.

The successful use of standard solutions like ERP systems implies also the definition and execution of business processes according to the software solution. Standard software systems include a process definition that is typically coded in the software. Depending on the vendor, this may allow no or only minor changes of the process definition. Modifications to the process logic of the software result in tremendous cost and may limit the effectiveness of the solutions. Many unsuccessful implementations of standard software solutions can be traced to one of two causes. The first cause is a lack of realization on the part of the customer that their business processes will change—usually for the better. A second cause is a desire on the part of the customer to so modify the process in the solution, typically in an attempt to preserve pre-implementation processes that the benefits of the solution are compromised.

Those process definitions delivered through standard software are more and more often described in so called software reference models. Those software reference models document the best practices supported by the application system. An example is the SAP R/3 reference models. Next business practices are generally not supported. The reason therefore is that they require new processes that nobody thought of during the standard software development. Only when a next practice becomes over time a best practice it will be included in the traditional software solution. The fix integration of process definition and software technology in traditional standard software systems is visualized in Figure 4.

Although application software systems like, for example, SAP's mySAP allow the customizing of thousands of tables to influence the process logic, resulting in alternatives in reference models, it still just reflects various best practices. If a customer does not want to follow the project logic of an ERP or other standard software system, this can cause challenges which can only be resolved through major software development investments, not only for the development of additions, but also for their integration and maintenance. This leads to dramatically increased total costs of ownership. As a result, new business processes used not to be supported appropriately by traditional software solutions. This situation did not permit improvements of productivity and performance based on next practices.

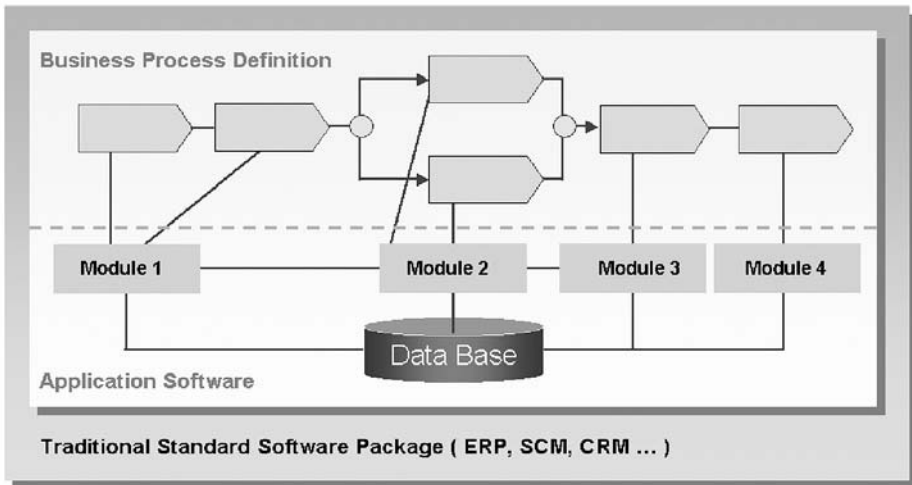


Figure 4. Traditional standard software: fix integration of process definition and software.

Therefore next business practices have to be supported through new software architectures, through next generation process automation, which ensures the necessary flexibility, combined with an acceptable cost. This is a key enabler of the agile organization.

Next generation process automation

The basis of the next generation of business process automation is the separation of the application software itself, the integration technologies, and the business process design. The application software provides the needed functionality to support a business process. The integration technologies, often called business process automation engines, consist logically of a workflow component that enforces the necessary process logic, and a data integration component, so called enterprise application integration (EAI), that ensures the availability of the required data. This structure is shown in Figure 5.

New business processes are defined in process models, representing the process definition. Based on the models the workflow engine is configured more or less automatically. This is possible though the use of standards for developing the process models, like the business process modeling language “BPML” (<http://www.BPMI.org>) or the business process execution language “BPEL” (Business Process Execution Language). These standards ensure that the workflow engine *understands* the process definition.

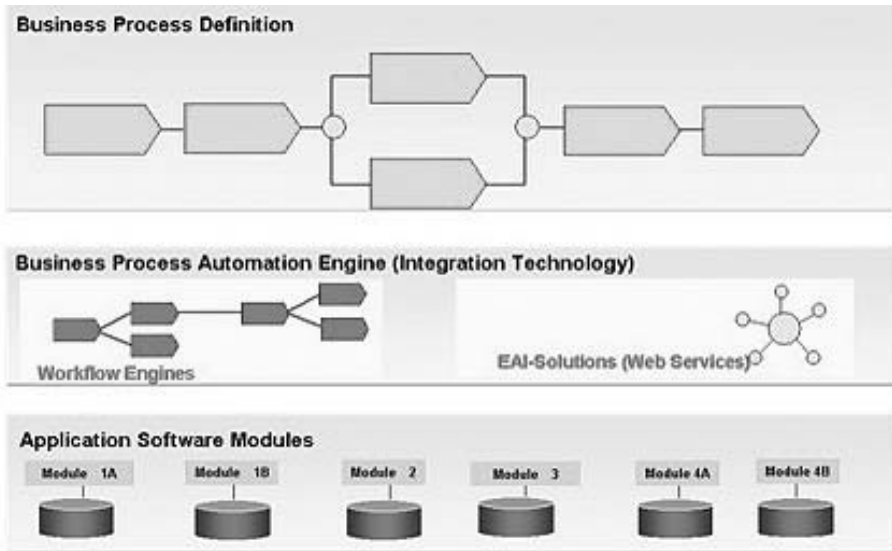


Figure 5. Components of next generation process automation:
Process definition, integration, application

The workflow engine then *organizes* when which application functionality is needed, and activates it accordingly. The *EAI environment* ensures the availability of the necessary data, which is transformed into a neutral format so that it can be forwarded from one application to the next, as required through the process definition. This procedure is visualized in Figure 6.

This next generation business process automation is technically implemented based on new software architectures. Existing application may be split or combined in order to deliver the appropriate functionality needed in various processes. The application functionality combined with the involved data and the logical procedure of applying the functionality on the data is often called a *component*. Such a component delivers a *service* that then can be used by another component, according to the defined business process logic. This allows an integration of applications without using difficult to maintain interfaces. If such a service is offered through the Internet using specific standardized protocols, it is called a *web service*. IT architectures that support such flexible, next generation business process automations are called Enterprise Service Architectures (Kalakota and Robinson, 2003) (Woods, Enterprise Service Architectures, 2003).

These next generation process automation environments deliver the flexibility necessary for supporting next business practices at an acceptable cost level. Existing application software is used as far as possible; only really missing functionality has to be developed. No specific interfaces are to be developed and maintained which again reduces the total cost of ownership (Woods, 2003) (Bruckert and Grasman,

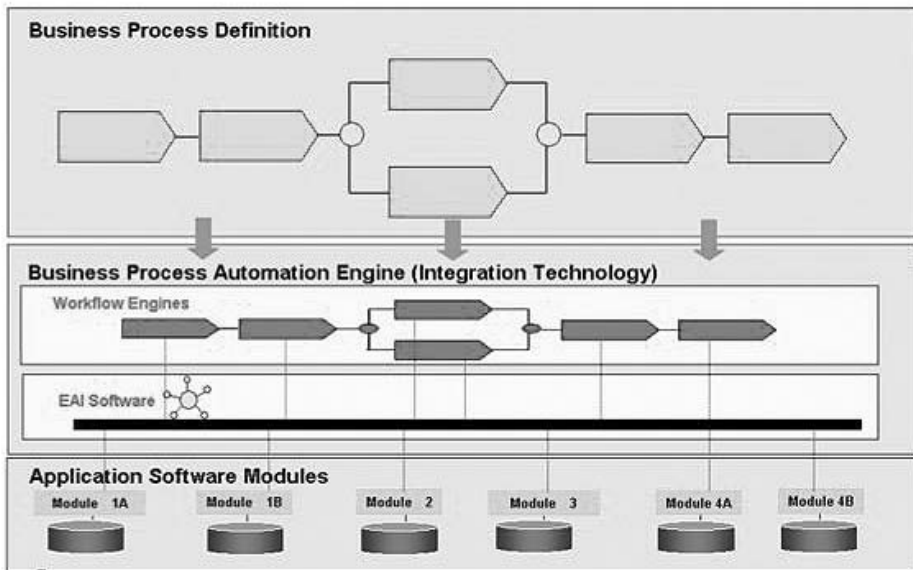


Figure 6. Next generation process automation: how it works

2003:8-9). Therefore next generation process automation environments are a key enabler for the agile organization.

Next generation process automation solutions can be used to support processes within an enterprise or across multiple enterprises. Thus they enable intra- and inter-enterprise processes.

However, such automation solutions require a very thorough process definition. The development of appropriate business process models is key for the successful use of such process automation solutions and with that for the execution of the defined process strategy. The agile enterprise requires detailed process design and the documentation in formal process models.

SAP NetWeaver and its integration with the ARIS Business Process Platform is an example of an IT environment that supports such an automation of next generation process automation (Bruckert and Grasman, 2003:10-11). The processes are defined in the ARIS Design environment. Based on the process models the XI-Process Automation engine is configured, so that it calls the appropriate application components during the process execution. After the execution the business performance of the process (cycle times, frequencies) is measured through the ARIS Process Performance Manager. This environment is shown in Figure 7. Microsoft, IBM, Oracle, BEA, and numerous smaller vendors build and deliver similar solutions (Schulte, 2003).

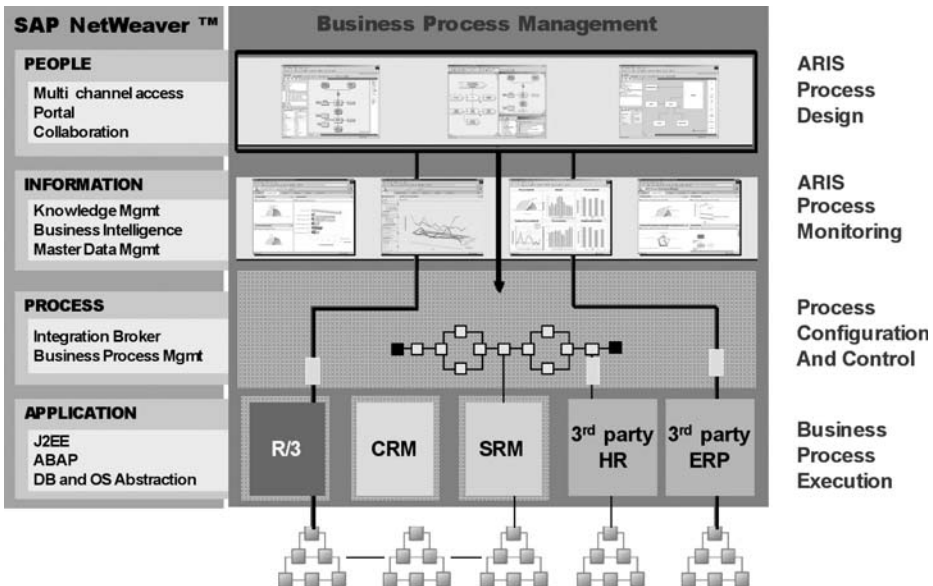


Figure 7. SAP NetWeaver and ARIS Process Platform—Example for Next Generation Process Automation

Composite applications

This new generation of process automation allows, as explained, the combining of existing applications with new applications seamlessly, avoiding integration challenges experienced with traditional application environments. This allows the integration of best and next practices in an agile environment.

However, in order to automate next practice business processes you may not even need new, not existing application functionality. It may be sufficient to use existing application functionality in a new process logic. Next generation process automation environments allow the rapid development of such *composite applications*. They deliver a process definition, an appropriately configured workflow and data integration, and use one or several existing software modules. Composite applications support a specific *new* business process, which has not been supported by the existing software solution. They represent business content of next generation process automation systems.

These composite applications may be built based on already implemented standard software packages like ERP, SCM, or CRM systems (Woods, Packaged Composite Applications, 2003), allowing an enterprise to use those systems in a new way. These composite applications may also add the functionality of available, specialized third party software in order to support the defined business process.

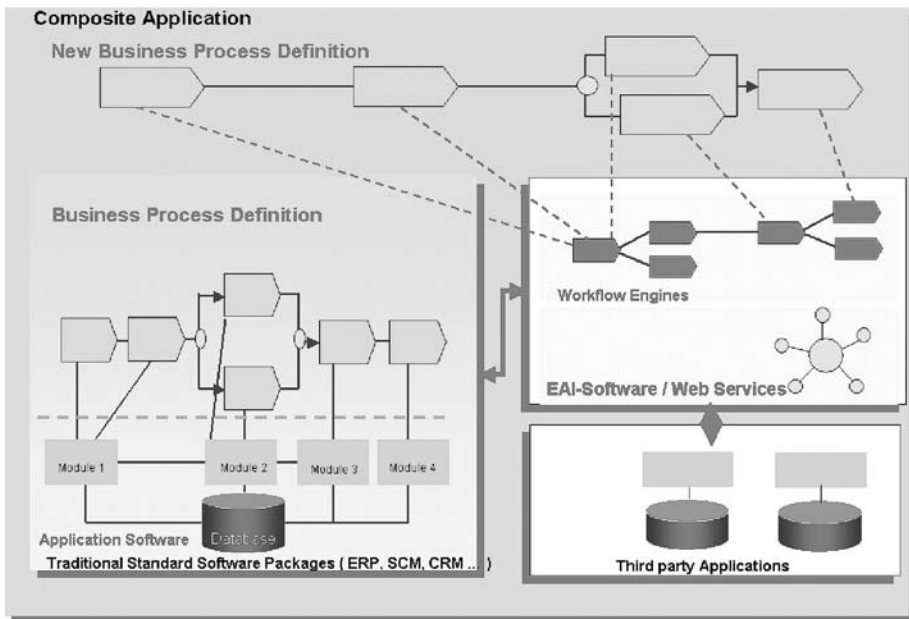


Figure 8. Composite applications: New processes based on existing applications.

The idea of those composite applications is visualized in Figure 8.

These composite applications built on existing standard software, can be offered as packaged solutions on the market, a way of distributing next business practices (Woods, PCA, 2003). Software or consulting companies, or even end-use companies, may develop such composite applications and offer them as *next practices*. These next practices are likely to eventually become best practices. Examples for packaged composite applications are SAP xApps (Stolz, 2003) that are offered by SAP and its partners, providing new processes solutions based on existing SAP applications.

THE BUSINESS PROCESS FACTORY— A CRITICAL LINK

Key for the efficient and effective use of those next generation process automation solutions in an agile environment is the structured and reusable definition of the business processes to be supported. Those business processes reflect the combination of best and next practices. These processes are defined in process models on the specification layer of the ARIS House of Business Process

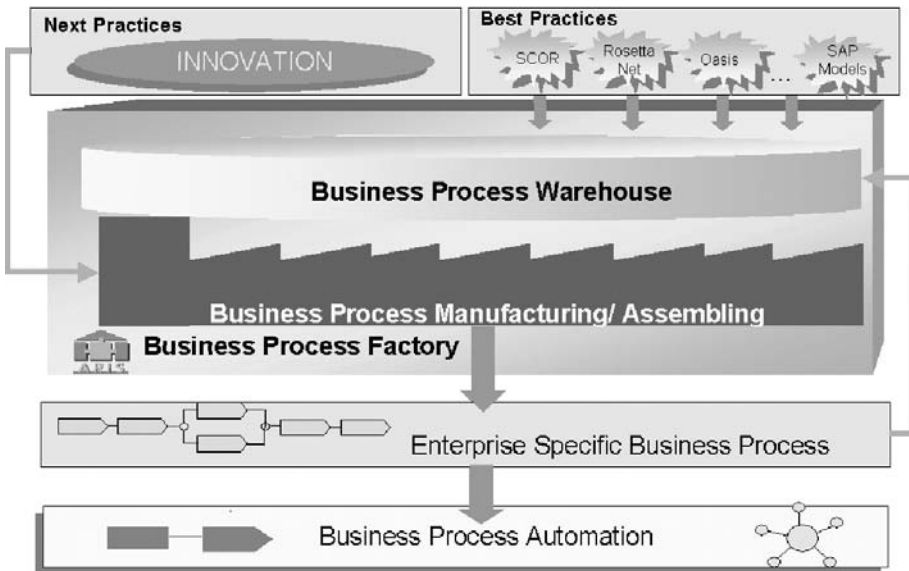


Figure 9. Business process factory—efficient and effective

Excellence, described above (Scheer, 1998). They are the key enabler for the agile organization.

As explained above, those models are the basis for the successful use of next generation process automation environments. They have to be developed and modified frequently in order to support a continuous innovation and improvement reflected in concepts like the adaptive enterprise or the real time enterprise. The business process factory is the environment that enables productivity and performance through the management of business process models (Kirchmer, Brown, and Heinzl, 2002). It's the critical link between the strategic decision to innovate and improve and the operative realization and execution of those decisions. That means the process factory is a core application environment for the agile organization. The concept of the process factory is shown in Figure 9.

Best practices are available on the market in the form of process reference models. They are delivered by industry organizations such as the Supply Chain Council, RosettaNet, BPMI, or Oasis, and by consulting companies or by software companies (Kirchmer, Business Process Oriented Implementation, 1999). Those models are stored in a database, called the *business process warehouse*. They can be used as *best practice process components* for the specification of enterprise specific business processes.

In the *process manufacturing and assembling* unit of the business process factory, enterprise specific business process models are either *assembled* using those

available process components or new processes are manufactured based on the planned innovations of an enterprise. The result is the desired combination of best and next practices, reflected in the enterprise specific process models.

Those enterprise specific models have to be consistent and reflect exactly the desired future business processes. Every mistake in the process models leads to a mistake in the following execution. Therefore the simulation of processes, the development and comparison of various scenarios, and a thorough cost and time analysis of the designed processes is extremely important and a core component of the process assembling and manufacturing.

Those process models are forwarded to the next generation process automation environment where they drive the configuration of the workflow and integration solution. This ensures a process execution according to the developed process design.

The process models are also stored in the process warehouse. This allows their later reuse for a roll out to other locations, outsourcing or other partners, new holdings realized through mergers & acquisitions, or just a further improvement of the process.

The physical realization of this process factory can be done using the ARIS Business Process Platform (The ARIS Process Platform), as part of the overall process lifecycle management, explained above. The integration of the ARIS solutions into process automation environments, like for example SAP's NetWeaver or solutions from vendors like WebV2, Intalio, Savvion or Vitiria, allows the seamless hand over of the process models and their reuse in the automation environments to drive the configuration.

The business process factory enables the business driven efficient use of next generation process automation environments to achieve competitive advantages. Technology enablers are environments like the ARIS business process platform. Best and next business practices can be implemented based on the concept of the business process factory (Elzina, Gullede, and Lee, 1999) (Scheer et. All, 2002). By being prepared to implement and dynamically manage the lifecycles of best and next business practices, an enterprise can be transformed to an agile organization that is better prepared for long-term success.

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INTRODUCTION

THE AGILE ENTERPRISE



*Reinventing your Organization for Success
in an On Demand World*

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Most change initiatives that end up going nowhere don't fail because they lack grand visions and noble intentions. They fail because people can't see the reality they face. Likewise, studies of corporate mortality show that most Fortune 500 companies fail to outlast a few generations of management not because of resource constraints but because they are unable to "see" the threats they face and the imperative to change. "The signals of threat are always abundant and recognized by many," says Arie de Geus. "Yet somehow they fail to penetrate the corporate immune system response to reject the unfamiliar."

Senge et al. (2004), Presence: Human Purpose and the Field of the Future, p. 29

In the Spring of 2004, IBM conducted a massive global survey of CEOs. Over 450 CEOs from large, medium, and small enterprises across many industries responded to the survey and many spent time one-on-one with IBM consultants to provide qualitative comments. When asked what would have the greatest impact on their organization over the next three years, an overwhelming majority of the CEO's

identified continuous changes in market forces to have the greatest impact. They talked about the intense and ever increasing competition, continuous changes in market dynamics, and rapid changes in customer needs and wants as the major market forces. Very few of them said they considered their organizations to be ready to respond to these changes, and most talked about Responsiveness, Agility, and Flexibility as the new key competencies to survive and sustain. Amongst many things the CEOs talked about wanting to urgently implement, the following two stand out as the summary of their combined wisdom:

1. “We have to implement a competitive intelligence capability so that the organization can react quickly.”
2. “We have to be quicker and must anticipate and respond almost intuitively to changing customers needs.”

These results are reinforced by the results of the 2004 Conference Board CEO Challenge survey. This survey asks CEOs to identify the top ten challenges that they face. Second only to “Sustained and steady top line growth”, “Speed, flexibility, and adaptability to change” was identified by 42% of the 539 CEOs responding to the survey.

In her keynote talk at the Gartner Symposium, Carly Fiorina, Chairman and CEO of HP, citing Darwin’s theory of evolution, said, “The company that thinks it’s done is done. Darwin said it’s not the most intelligent or strongest that survives, but those that adapt the most readily to change. It’s not about fixing a company and stopping it, but it’s about a company being able to adapt.”

In his book, *Adapt or Die*, Claus Heinrich, a member of the SAP Executive Board, describes how adaptive business networks can help businesses meet the extraordinary challenges of the 21st century and what they will need to change in order to survive. “Falling margins, accelerating innovation, and production cycles, as well as globalization are forcing companies to become more flexible in order to meet these challenges.” He explains why this new business model is necessary for survival—and not merely an option.

“Responding to intense pressures, organizations are trying to become more agile and responsive to customer demands,” says a Xerox report.

Bill Gates talked about the velocity of change. He said the 1980’s were all about computing, the 1990’s were all about bandwidth, and this decade will be all about change and the increased velocity with which everything will be changing.

The common thread that runs across all of the above prophecies by visionaries is again that of **change** and **speed**!

A couple of years ago, we had a massive strike of dock workers which idled all of the ports along the west coast of USA from Los Angeles to Seattle for 10 days.

Dell's business process model operates with only a couple of hours of inventory in their Austin plant with supplies coming in just in time from their suppliers in Asia. When the strike hit, many industry watchers thought that Dell would soon run out of materials and product production would grind to a halt leading to plummeting sales. Indeed, many manufacturers and retailers suffered exactly that fate during that same period. But this dire prediction was not realized at Dell. Showing a remarkable ability to anticipate the strike in advance and responding with speed, Dell chartered Boeing 747s, as many as 18 in number, and much before others tried to do the same, to bring in supplies from Asia. They had already booked these chartered flights in advance with a very good price break, while others scrambled to find planes to charter and paid exorbitant prices. This is agility in action!

It is no surprise that the advisory board of the eBusiness Research Center (eBRC), which is comprised of senior executives of leading American and global corporations, identified adaptive organization as the top focus area for research in 2003/2004. In May 2004, eBRC organized a workshop in New York City. Thought leaders from the industry and academia came together to deliberate with a group of selected participants on the issues, opportunities, and challenges of an adaptive organization. The deliberations at this workshop led to the conclusion that agility is a more appropriate term to use to describe these issues from a strategic perspective and adaptability from a tactical perspective. The following two key statements summarize the deliberations of this workshop:

1. From sense and respond to anticipate and lead: If you are planning to sense the changes and then respond, it is already too late; rather anticipate the coming changes and execute with speed to lead.
2. From alignment to synchronization: Aligning your infrastructure to changing needs and wants is not sufficient. Instead, seek to synchronize your infrastructure changes to the changes of the environment—a characteristic of a real-time enterprise.

Sam Palmisano, IBM Chairman and CEO, recently said that today “people are trapped by their training, but 21st century workers won't be able to find answers in the past because things are rapidly shifting and new opportunities are arising so frequently.”

If answers cannot be found from the past, they must be found by postulating the future. It is with this thought in mind that thought leaders in academia and practice were brought together around this book and asked to share their personal insights and wisdom about agility issues. From their deliberations, recommendations were built about what organizations can do and should do to become an Agile Enterprise.

The various chapters in this book cover the “why”, the “what”, and the “how” from the perspectives of the contributing experts. We, the editors of this book, did not attempt to rationalize the various chapters into one coherent thought. Instead, we maintained the originality and the integrity of the analysis and the insights so that you the reader will have a feast of ideas to think about and find the most that suit the initiatives within your organization.

Also, the premise of this book is not to be prescriptive, as prescriptions will vary case by case. We attempted to be descriptive, using anecdotes to make a point, case studies to deliberate on key issues, and personal experiences and insights to identify emerging best practices.

ORGANIZATION OF THE BOOK

The book chapters have been organized in an order that seemed to make the best sense, so that if the reader reads the chapters sequentially the topics will unfold in a logical and orderly progression. But this book can be read from back to front because the chapters are relatively independent in content. It is the overall theme of agility that provides the linkages between the chapters. Chapter summaries are provided below, which will help the reader to get a quick outline of the whole book and to choose the reading order that suits the reader’s current needs and perspectives.

Chapter summaries

Chapter 1: Emergence of the Agile Enterprise: Building Organizations for the Global, Digital Economy

The emerging global, digital economy is forcing businesses to devise new strategies, develop new capabilities, design new organizational structures, and deploy new business models. The disruptive effect of fast technological innovations and adoptions redefine the essence of today’s competitiveness. Traditional forms of organization can no longer respond effectively to the new marketplace dynamics. Businesses cannot compete with inflexible infrastructures, outmoded business models, and fixed products and services. Across the business landscape, we are witnessing the emergence of Agile Enterprise. In order to thrive successfully, these enterprises adopt new visions & values, embrace breakthrough culture, cultivate entrepreneurial teams, and construct adaptive infrastructures.

We use the concept to accentuate the imperativeness of today's organizations to anticipate changes, adapt swiftly to the changes and assert effectively for strategic gains. This chapter elaborates and explores Agile Enterprise within the context of today's marketplace.

Chapter 2: Business Process Automation: A Framework for Combining Best and Next Practices for the Agile Enterprise

Agile enterprises must adapt to continually changing business environments in order to survive in the long term. To do so they have to combine best and next business practices. Best practices ensure efficiency; next practices really lead to competitive advantages. Traditional business process automation solutions, like ERP, SCM, or CRM systems focus on the implementation of best practices. Next generation process automation enables the implementation of next practices at an economically acceptable cost level. This is possible through a flexible integration of business process definition and software application support. The appropriate software support must be dynamically adaptable to the business processes definition so that it supports the execution of enterprise specific processes. Business process models reflecting best and next practices drive the configuration of next generation process automation solutions that “orchestrate” the appropriate application support. They become the critical link between strategy and execution.

Chapter 3: Services are the Language and Building Blocks of an Agile Enterprise

A fundamental precept of “services” is that the customer is the judge of the value. It is critically important to deliver value, internally and externally, as formalized services because formalized services are the customer-driven governance mechanism of an Agile Enterprise. Formalized services, by their very nature, can serve as the common language between an enterprise and its customers and between the LOBs and IT. By utilizing a horizontal architectural model such as Darwin, formalized services can serve as the building blocks of an Agile Enterprise. A service maturity model that identifies what services are delivered to internal and external customers can serve as the framework for judging progress along the Agile Enterprise journey. This service maturity model can be extended across multiple management of change disciplines to guide progress, reduce risk, and maximize return on investments. The tactical changes, experienced by every enterprise on a regular basis, can be leveraged towards the strategic intent of transforming into an Agile Enterprise.

Chapter 4: The On Demand World: Mapping the Government Genome

The government genome is an excellent structure to understand information flows among components. The enterprise architecture defines the standards governing how information is managed and exchanged. The IT capability includes computing platforms, operating systems, software, data, and networks required to support the components in the overall business model.

The enterprise architecture provides the framework for selecting specific products and building a capability that can adapt to changing requirements over time. IT is the lifeline to enable integrated business activities to work by seamlessly connecting government departments, partners, and suppliers. The cumulative result of these technology infrastructure changes is a real opportunity to leapfrog incremental change, to integrate disparate, standalone operations internally and externally, and optimize them as an integrated whole so they work better together and deliver additional value.

Chapter 5: Innovation Management in an Agile Enterprise

This chapter looks at the key role innovation must play within an enterprise faced with uncertainty in a rapidly changing global environment. To set the scene, we briefly discuss the macro-economic trends that make innovation mandatory, not a luxury. These trends lead to fundamental changes in the nature of innovation from a purely product or service focus to continuous and holistic creativity in all aspects of business. To succeed the enterprise becomes an “innovation engine”. This demands new management skills—skills that most of you will not have learned as, even now, they are just appearing in education curricula. You will gain insight into these “new” innovation forms through some short cases illustrating the seven major new attributes that successful “innovation engines” exhibit. We also discuss how, as managers, you can lead your corporate culture to support continuous and agile innovation. Finally, you will learn how innovations in innovation management itself can be used to mine the know-how, experience, and creative capacity of your organization in real-time while underpinning a supportive culture.

Chapter 6: Agile Enterprise and Offshore Outsourcing

Internet-enabled offshore outsourcing is enabling firms to become agile. The strategy has matured considerably over the past five years and offers significant advantages to companies that know how to do it right. Companies looking to cut operating costs, focus on core competencies, extend customer service, comply with

new regulations, or achieve other goals now count offshore outsourcing as one organizational strategy they can use to process and absorb change. Organizational strategies tend to come and go, but offshore outsourcing has staying power. It is a powerful idea, albeit a difficult one to implement, that can produce substantial rewards. Adaptive enterprises such as Dell, IBM, HP, and GE have already seized this model to create new value propositions. Change is constant in the business world. Inflexibility in any form, whether in legacy systems or employee attitudes, is the enemy of adaptive, competitive companies. If agility is the goal, offshore outsourcing is one of the methods organizations can use to attain it.

Chapter 7: Adaptive Innovation Management

This chapter identifies that managers who primarily focus on increasing the speed of their innovation processes lose sight of the long-term strategic implications of their innovation decisions. Moreover, agility demands an understanding of customer demands and reliance on customer feedback. Ironically, simple customer feedback masks the underlying customer problem sets—and only a deep understanding of customer problem sets allow managers to develop innovative customer solutions that break out of standing customer need and product definitions. Hence, managers must recognize how imperative a deep linking to customers' markets and problem sets are. In linking to customer problem sets, the scope of innovation must also be redefined. Rather than working on developing new products or services or product/service platforms, companies must understand and link their internal capabilities to customer problem sets. This requires innovation at an organizational level with a strategic, systematic, and systemic focus. Companies that implement such an adaptive innovation management model will have to ensure a supportive infrastructure and culture, but can look forward to significant returns to their innovation investment.

Chapter 8: The DNA of Organizational Agility

The process of codifying and scaling tacit knowledge into well-defined business processes, technology enablers, and other “hard” assets and artifacts that many others can use consistently, effectively, and cost-effectively determines whether or not an organization can be and is agile. How so? Being agile requires a critical mass of people and underlying processes supporting those people to be able to move quickly in response to or in anticipation of specific opportunities. The only way to mobilize such a broad base of people and processes moving in a directed fashion is through a shared understanding of what is expected, of what to do, of how to do it, and of measuring the value of those actions. We often hear the

discussions around ‘standards’, ‘frameworks’, and the need for ‘shared business and/or technology semantics’ for effective action, all of which reflect the end result of this process of codifying ideas, nascent value propositions, and best practices into organizational activities and means that can be scaled. And it is this *process* of codification that comprises the underlying DNA for organizational agility.

Chapter 9: Agile and Adaptive: Making Organizations More Responsive to Customers—A Xerox Case Study

What started as a search for reasons as to why Xerox customer satisfaction data was not assuring customer loyalty or explaining defections from Xerox has gone well beyond that, creating a model for customer relationships that is making Xerox both more agile and more adaptable in serving customers. The work that led to the development of Sentinel has provided plausible reasons why many customers defect—the lack of quick identification and appropriate solutions of all problems customer end users may have. Conventional customer satisfaction measurement cannot address this lack; it took the development of an innovative new solution, Sentinel, to do that. Sentinel is really a true sense-and-respond system—a customer-back, role, and accountability structure for action. It’s much more than a great marketing idea; Sentinel is a way for Xerox and its customers to co-create new value. And that’s the real definition of adaptability.

Chapter 10: Implementing the Agile Enterprise: The E-Business Opportunity Model

Established organizations continue to struggle with how to evaluate the potential of applying Internet Technologies to create competitive advantage and implement the concept of an agile enterprise. The examples and insights presented by obvious Internet success stories such as Amazon.com do not easily apply or leverage the strengths (and weaknesses) of established firms and industries. The E-Business Opportunity Model (EOM) and its associated E-Business Opportunity Index (EOI) described in this article provides managers with an easy to apply and comprehensive tool for analyzing an industry and targeting areas of opportunity to implement the agile enterprise. The EOM and EOI provide managers with a tool to practice open-ended processes of *strategic discovery* needed to create the agile enterprise. We see through the case studies that e-business can potentially reduce barriers to entry and provide opportunities for increases in the efficiency of transactions. However, our analysis also reveals that the complexity of variations in government regulation and the lack of ability for e-business sites to deliver a sensory experience to customers can be barriers to the implementation of an agile enterprise strategy.

Chapter 11: Security and Privacy for the Agile Enterprise

Organizations that maintain the flexibility to quickly adapt to changes in their environment require tools, frameworks, and repeatable process to allow them work through the uncertainty and appropriately address the risks generated by the changes in their operations or business environment. For example, organizations that allow customers to access and manage their personal data through on-line systems to reduce the amount of customer service calls, have opened up the organization's IT environment to the Internet and the potential threats encompassed in using the Internet as a means of communication. In terms of security and privacy for data within today's organizations and their ability to protect that data in lieu of new and changing methods to use that data (i.e., accessing information on-line or outsourcing data processing), the Agile Enterprise needs to have in place a security and privacy foundation. This should efficiently and effectively address the risks related to its current environment or new business initiatives, and provide the appropriate risk migration strategies that would allow the organization to take advantage of the change in the marketplace without adding additional risk to the overall organization.

Chapter 12: Small Manufacturers and the Agile Enterprise

Becoming an agile enterprise with the ability to respond quickly and effectively to changes in the global business environment is a business necessity. That means adding the tools, techniques, and technologies to your small business operations. Which tools, which techniques, and which technologies depends on your customers and markets. Get closer to your customers. Find out what their real needs are. Add services to what you offer. Make yourself indispensable. Ask yourself, "What value do I bring to my customers? Is it in design, service, being close to the market, or something else?" If you make a product, take a good look at the ones that require tight tolerances, are difficult to manufacture, or have critical reliability requirements. Look at the processes used to make them. Are they unique processes, or do they require specialized, skilled labor that gives you an advantage? Having asked yourself these product and service questions, now ask yourself about your customers. Do you have the right customers? Next, ask about your company's operations. Are you as cost competitive as you can be? Using the answers to those questions, then invest in and restructure your business to become as agile as possible, and be positioned to take advantage of opportunities as they become available.

Chapter 13: IT and the Agile Government: The Role of Information Technology in Improving the Efficiency of Government Functions

The process of setting up government IT systems and organizations to achieve agility is an arduous process. A long list of challenges such as limited budgets, leadership turnover, restrictive regulations, and retention of manpower continue to make the process a challenging one. To effectively use IT to achieve the long-term goal of agility, government organizations need to be aware of these barriers and be willing to meet these challenges. This chapter uses The Pennsylvania State Government to illustrate how governments must respond to the challenge of becoming an agile organization. The PA State Government is made up of 43 separate agencies, serves over 12 million people, and oversees a \$52 billion budget of state and federal expenditures. To work with maximum efficiency and effectiveness, the state has to be able to respond quickly to a changing environment. The challenge is how to achieve agility given the complex and somewhat cumbersome structure of government.

Various chapters in this book offer multiple perspectives on the imperatives and challenges of an Agile Enterprise—from very broad strategic issues down to implementation issues of process transformation, e-business leverage and IT infrastructure. The chapters address various perspectives on agility from industry to government, from large to small, and from strategic to tactical. There will be many opportunities for innovation and enhancements in realizing a real-time enterprise in the decades ahead of us. We hope that the foundations offered in this book will help readers and researchers in making those next practices innovations.

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1

EMERGENCE OF THE AGILE ENTERPRISE



*Building Organizations for the
Global, Digital Economy*

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MICHAEL LIM, CEO, GREY INSIGHTS

INTRODUCTION

When Wal-Mart noticed a significant increase in the sales of US flags, lapel pins, and other patriotic items immediately after the September 11, 2001 tragedy, the world's largest retailer immediately locked up all the supplies they could find. On the evening of 9/11, the buyers at Wal-Mart had already ordered all of the available flags in the supply chain. Other retailers like Kmart and Target were slow to respond and for a while, these items could only be found in Wal-Mart stores. Zara, a Spanish clothing retailer, had black clothes on the shelves of their stores immediately after the 9/11 events. How could they react so quickly? Wal-Mart was able to respond because they had a "real-time" tracking and analysis system that helped them to see the surge in demand, and their supply chain was able to quickly respond to the situation. In Zara's case, while the normal lead-time for clothing to be manufactured was 90 days, they anticipated the need for black clothes and responded quickly to get the black dresses made and delivered to their store shelves. So, if you are competing with the likes of Wal-Mart or Zara, you need to have similar abilities to anticipate or sense marketplace changes and then respond to those changes with speed. Otherwise, you are history!

Today, *more than ever*, corporate success depends on the ability to anticipate, adapt, and act on economic, technological, and social changes over time. It's tough to sense as well as respond to the changes in the global, digital economy—and it's getting harder all of the time. Predictability, linearity, and “one best way” no longer characterize the business environment. Schumpeter's *gales of creative destruction* are sweeping ferociously across the economic ecosystem. This is evidenced in the *Global CEO Study 2004*, conducted by IBM Business Consulting Services, in which CEOs across all industries highlighted market forces as the most important external factor that will affect their organizations in the next three years.

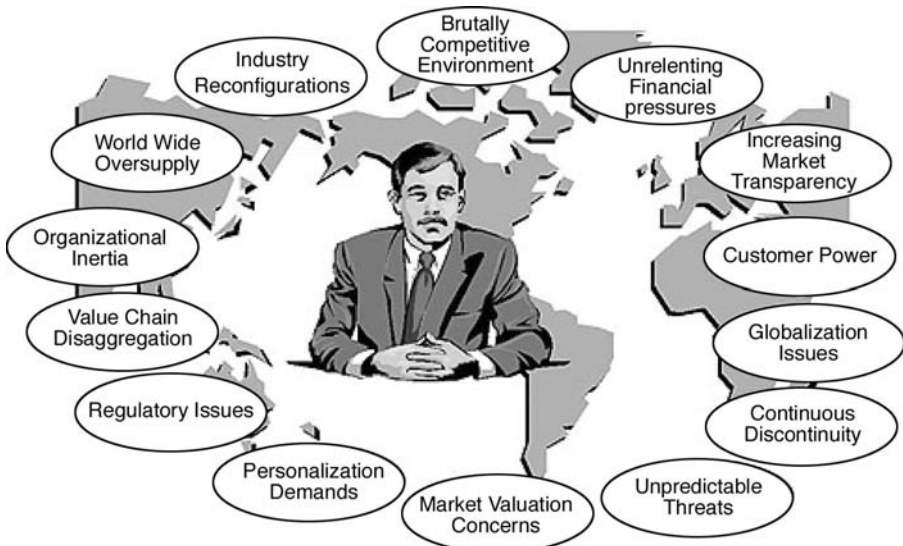


Figure 1. Market Forces in the Global, Digital Economy

It is the agglomerations of market forces that are fueling today's volatility and velocity. Faced with greater variety and choices in the marketplace, the power has shifted toward consumers. They are demanding higher quality products, greater personalization, better services, faster delivery, and bigger discounts. It's no wonder that one CEO in IBM's *Global CEO Study 2004* remarked: “A product that used to score nine out of ten with its customers, now merely gets a six”.

At the present time (*and* the foreseeable future), the Internet remains one of the major disruptive forces in the marketplace. Cyberspace enables consumers to form online communities, which can adversely affect brand names and company reputations. More and more consumers are also using the World Wide Web to influence their purchasing decisions. The global, digital superstructure has caused the world market to become more integrated, but at the same time, consumer needs are becoming more diverse and segmented, causing organizations to respond with

marketing, sales, and distribution programs that are more diverse and segmented. Procter and Gamble is a good case in point. The Fortune 500 household products company has been manufacturing their famous brand *Tide* detergent since 1949. Their 30-second commercials on national television channels are legendary and are often considered to be benchmarks in mass marketing. Today they have fourteen versions of Tide, specially designed for fourteen different target markets, which has caused their marketing campaigns to be more customized. They now spend less on broadcast media like network television and more on narrowcast media like the Internet, radio channels, and specialized magazines and cable television channels.

Executives are also facing unrelenting financial pressures. The median rate of return for US consumer product goods has fallen. Shareholders and analysts too are becoming impatient with market valuation concerns. Accounting scandals bred mistrust and caused the imposition of stricter regulations *e.g.* the Sarbanes-Oxley Act. In recent years, organizations have faced numerous new regulatory issues, namely cross-border e-commerce, online tax, privacy issues, and homeland security. This is compounded by the unpredictable sources of external threats *e.g.* the 9/11 World Trade Center attack, SARS, the war in Iraq, Mad Cow diseases, the Bird Flu Epidemic, the power blackout in Northeastern United States in 2003, and computer viruses.

The disruptive effect of fast technological innovations and adoptions redefine the nature of today's competitiveness. With the influx of new and innovative competitors in the global marketplace, the dynamics of industries are changing. The Internet and advances in communication technologies have made outsourcing more economically compelling, especially offshore outsourcing

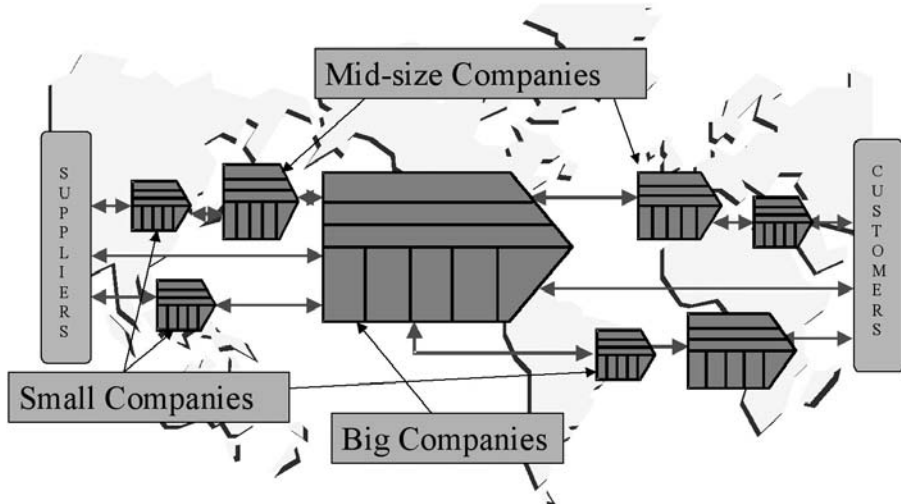


Figure 2. From Value Chains to Value Networks

which is expected to reach \$17.6 (US) billion in 2005 from \$5.5 (US) billion in 2002 (IDC). Vertically integrated value chains are disintegrating into virtually integrated value networks (see Figure 2), where collaboration, co-creation, and co-opetition between firms are critical success factors.

Industries are reconfiguring and redefining as the thrust of their main products and services undergo transformation. Coca Cola is making more money selling bottled water than Coke. GM is making more profit from its financing operations (GMAC Financial Services) than its automotive division. 80% of Unisys' revenue is coming from services than products. Over 50% of IBM's revenue is coming from services. To remain competitive in such a rapidly changing and complex environment, organizations are trying to change but are challenged with inflexible business and Information Technology (IT) infrastructures. At the same time, they face cultural issues that also resist rapid change. IBM, which is a textbook success story in transformation, took six years, from 1993 to 1999, to align itself with the industry.

The increasing level of uncertainty and complexity requires new organizational configurations and operating models. Traditional forms of organization can no longer respond effectively to the new marketplace dynamics. Mechanistic organizations have difficulty responding to the changing circumstances. Businesses can no longer operate with inflexible infrastructures, outmoded business models, and fixed products and services. Manuel Castells, one of world's best-known social scientists, observed this era as the "crisis of the traditional corporate model of organization based on vertical integration, and hierarchical, functional management" (Castells, 2000; p. 168). In this era, we are witnessing the rise of new organizational principles. With technological advances, alternative models become possible, viable, and feasible for managing in today's marketplace.

EMERGING AGILITY

Organizations co-evolve with their environments. Every organization continuously reacts to prices, forecasts, sentiments, trends, and political scenarios. Strategy creation is a continuous process, an open-ended process of *strategic discovery* (Hamel, 1996). In the complex environment, a business is always a prototype subject to constant experimentations, and it is always being creatively constructed and deconstructed over time. Of course, the prototype cannot be too volatile and instable, as it prevents productive behaviors from emerging. It needs to be poised at the edges-of-chaos (Kauffman, 1995). *Built to Adapt*—that's the strategic theme of today's organizations. Organizations need to transform from *make-and-sell* to

sense-and-respond (Haeckel and Nolan, 1993). Businesses have to become agile to thrive in the volatile and complex environment.

We need the redefinition and reconceptualization of *agility*. In the rapidly changing marketplace, technologies set the pace. Information technology, particularly the Internet, is causing upheaval in many industries. The Internet took only four years to reach 50 million users whereas the telephone took over 74 years, the radio took 38 years, and the television took 13 years. The Internet is dissolving boundaries, and its impact is experienced worldwide (though not evenly distributed *yet*). The global digital network offers a wide range of possibilities for enterprises to co-create with their customers, to coordinate with suppliers and partners, and to generate revenue.

As businesses progress up the learning curve, we observe more creative and productive applications of Internet technologies for revenue generation and costs reduction. Dell Inc., Charles Schwab, Intel, Boeing, IBM, NTT DoCoMo, HP, Ford Motor, eBay, and many more global corporations are utilizing the Internet for millions of dollars of transactions each day. General Electric, Cisco Systems, Oracle, and many more claimed to have saved billions of dollars in expenses by digitizing their operations. Incumbents are redefining and redesigning existing business methodologies, and start-ups are carving and solidifying their niches in the new economy. *Full steam ahead!*

Today, executives are forced to rethink many key business issues. Rules, expectations, processes, structures, relationships, tactics, and winning formulas are changing. The Internet is reconfiguring the way enterprises communicate, redefining value-creation processes, enhancing customer value delivery channels, streamlining supply chains, altering industrial structures, and re-writing the rules of competition. It has also exposed the vulnerabilities of many traditional business models and assumptions. For example, the music industry is countering the onslaught of online file-sharing activities. MP3 technology compresses the music file without significantly deteriorating its quality. MP3.com was a community where artists and music fans could download and upload MP3 files. However, its inherent lack of consideration for protection against the illegitimate downloading of copyrighted music files instigated the 'wrath' of the music industry. The Recording Industry Association of America (RIAA) sued MP3.com and succeeded in proving to the court that it violated copyrights in April of 2000.

Attentions then shifted to Napster. Napster technology operates on a peer-to-peer architecture that enables members to swap MP3 music files with greater ease. In Napster's community, MP3 files are not stored in Napster-owned servers but in hundreds of thousands of individual PCs which belong to the members of the Napster community. Napster only provides servers for directories and search capabilities within the community. In November of 2000 alone, 1.76 billion

downloads occurred and there were approximately 57 million users worldwide. Even Andrew Grove, then Chairman of Intel Corp., commented, "The whole Internet could be re-architected by Napster-like technology." (Raul, 2000) The RIAA sued Napster for being an accessory to piracy. In July of 2000 the U.S. District Court in San Francisco found Napster liable for the exchanges of pirated MP3 files within its community and ordered it to shut down. After MP3.com and Napster, the industry faced new breeds of peer-to-peer file sharing technologies such as Kazaa, Limewire, iMesh, Shareaza, and BitTorrent.

However, it's not all gloom and doom for the music industry considering the widespread popularity of Apple's iTunes online music store and its iPod music player. iPod is one of the hottest new products in the market today. Since the portable music player was introduced in October 2001, Apple has captured 58% of the music player market by having sold over three million units. It is estimated that the iPod will account for about 15% of Apple's revenue in 2004. iTunes Music Store, Apple's legal music downloading service, has also experienced commercial success. Launched in April 2003, the online music store sold its 100 millionth song on July 11, 2004. It is the world's number one online music service with more than a 70% market share of all legal downloads of songs and albums. This amounts to over two percent of the legally sold songs in the USA, and was achieved within fifteen months. Who would have predicted that this pioneering, legal, music downloading business would become a growing billion-dollar business for Apple within such a short time? According to Forrester Research, digital music downloads are estimated to worth \$201 million by end of 2004 and will grow to \$3.1 billion by 2008. Not surprisingly, the online music business is already attracting competitors. The re-launched Napster offers 99 cent per song with over 700,000 songs available on-demand. In August, 2004, Apple's rival in the music downloading business, RealNetworks, announced a forty-nine cents downloading service against ninety nine cents charged by Apple for each downloaded song. This is a special sale for a short period, but it will surely heat up this fledgling market. In September 2004, Microsoft launched its 'preview version' of MSN Music to compete with Apple's iTunes. Many other big players like Yahoo, MTV, and Virgin are planning to enter the market too, *as expected*.

Now, let us see what Starbucks is doing. In March 2004, they opened up their first *Hear Music Coffeehouse* where they have installed music listening stations with CD burning capabilities. With hundreds of thousands songs digitally stored in their servers, you can create your own CD with your specially selected songs in just a few minutes as you sip your latte. They plan to open 100 such stores by the year-end of 2004 and 1000 stores in 2005. While this is happening, the much bigger Tower Records stores are faltering, and their parent company filed for Chapter 11 bankruptcy protection early in 2004. This is a good example of what we mean by *emerging agility*. Let the most agile survive!

Another example is Encyclopedia Britannica. Though this is a much-used example, we think it is appropriate to revisit it here. For a long time, it sold its 12-volume set for more than \$1,000 US and employed an army of sales agents. Bill Gates offered to bundle the content with Microsoft products, but Encyclopedia Britannica refused. Later, Microsoft developed Encarta on CD-ROM, which threw the century-old business into a tailspin since Encarta offered a much cheaper alternative with a dazzling multimedia presentation of information.

In a highly dynamic marketplace, opportunities are fleeting and businesses must identify and seize opportunities as they arise. There are many cases of organizations with great inventions that failed to profit from them. Probably the best-known example is the failure of Xerox Corporation to capitalize on its Palo Alto Research Center's (PARC) innovations such as the Graphical User Interface (GUI) and the computer mouse. Xerox Systems Development Division commercialized GUI as 'Xerox Star,' but only 25,000 units were sold. However, Apple went on to utilize GUI (*and* also the mouse) for its then revolutionary Macintosh, and the rest is history. Another case is DaimlerChrysler's PT Cruiser. The carmaker couldn't produce the car fast enough to meet the market's demand for its 2000 and 2001 model years. The carmaker spent \$600 million developing the PT Cruiser, and it was a big hit in the market. Although its Toluca plant in Mexico couldn't roll PT Cruisers off of the assembly line fast enough, the carmaker couldn't shift overflow production to its plant in Belvidere, Illinois. This is mainly due to the incompatibility between the two production plants; the paint shop at the Belvidere plant is not tall enough for PT Cruiser. It is estimated that DaimlerChrysler missed the opportunity to add another \$480 million to its pretax profit. Inflexibility, as illustrated in the examples of Xerox and DaimlerChrysler, strategically impedes businesses' capabilities and capacities to compete and respond to unexpected shifts in the industry.

Agility is also about exploiting disruptions or punctuated equilibrium and to thrive in new areas of growth. Businesses must *jump the curve* and leverage on any industry shifts. For example, e-Business Exchange (e-BX™), an IBM Premier Business Partner, started out as a printing company (security checks, consumer packaging, stock scripts). In 1995, the changing technological landscape ignited the company's wholesale transformation into an IT company. Today, the company provides e-billing, e-procurement, payment systems, and services to big corporations *e.g.* An Post (Ireland), Cable & Wireless HKT, Deutsche Bank, HSBC and Hang Seng Bank, Singapore Telecom, and, together with Citigroup, supported FedEx, EVA Air, Dairy Farmers, and Cargolux. Nokia, the world's leading mobile phone maker, has also displayed a similar sort of transformation. It was once a Finnish conglomerate with diverse businesses from manufacturing paper and rubber boots to producing cables for telephone and telegraph networks. In May 1992, Nokia's management made a strategic decision to divest all non-core businesses and focus

on telecommunications. They *bet the house* on the then nascent, unproven digital technology for mobile phones known as GSM. With a 38% market share, Nokia is today's industry leader. However, its competitors such as Motorola, Samsung, Sony, Ericsson, and Siemens are attacking Nokia on all fronts. In addition, emerging technologies such as 3G and Wi-Fi are reshaping the industry landscape and challenging the viability of Nokia's existing business model. To continue powering its engine of growth, Nokia will have to constantly leverage and innovate both emerging and converging technologies.

In the early 1980s, IBM practically invented the personal computer industry. IBM PC soon became the industry standard. But in the 1990's, IBM simply could not keep up with competitors like Compaq and later, Dell. It finally abandoned the manufacture and distribution of personal computers to its business partners. It sold its manufacturing operations including plants and people to Sanmina Corporation, not only for personal computers, but other desktops as well as low-end servers. On the other hand, IBM is doing extremely well in the high-end server market, and has retained the development, manufacturing, and distribution to itself. IBM has been able to adapt to the changes that the numerous high-end server market has undergone. However, in the low-end server market, as well as in the personal computers market, the changes have been so radical that IBM has moved to an innovative business model of collaboration with its business partners in order to maintain its presence and lead in this sector.

In many instances, technological breakthroughs enable much nimbler competitors to leverage the technology to gain leadership positions in the marketplace. Incumbents have no choice but to adapt and respond to the constant threats. Nokia replaced Motorola as the world's biggest manufacturer of mobile phones in 1998. In the entertainment industry, Pixar Animation Studios is challenging the king of animation, Walt Disney Studios. In 1995, it produced the world's first fully computer-generated (CG) feature film, *Toy Story*. By leveraging on leading-edge rendering technologies and techniques to create photorealistic, animated feature films, Pixar has produced a stream of box-office hits that have so far grossed about \$2.5 billion. Across many industries, businesses are jostling for market leadership with greater speed and intensity. Examples include GM *vs.* Toyota, Palm *vs.* Pocket PC, Yahoo! *vs.* Google, Peoplesoft *vs.* Salesforce.com, Boeing *vs.* Airbus, Barnes & Noble *vs.* Amazon.com, Intel *vs.* AMD, Proctor & Gamble *vs.* L'Oreal, Sony *vs.* Apple, Pfizer *vs.* Johnson & Johnson, and AmericanAirlines *vs.* JetBlue Airways.

The growing interests on web services, outsourcing, organizational change, innovation, value chain deconstruction, modularity, learning organization, open source, creative destruction, complex adaptive systems, co-creation, and internetworking indicate the importance of agility among business practitioners

and researchers. Agile enterprise is today's organizing formula. It is designed to adapt and innovate with the key characteristics of (1) flexibility to changes and (2) sensitivity to "*what's going on out there?*" It encapsulates the movement towards the development of a new organizational paradigm and form for the 21st century economy.

AGILE ENTERPRISE

Agile Enterprise is the survival trait of the competitive marketplace in the global, digital economy. About 90% of the CEOs in the Global CEO Study 2004 said they will transform their organizations to become more responsive within the next five years. This is because most of the CEOs believe their organizations are not adaptive and agile enough to cater to changes in their current markets and at the same time pursue emerging opportunities. The Study elaborates: "*CEOs all over the world have identified organizational responsiveness, agility, and flexibility as necessary competencies. Developing the ability of the organization to not just sense, but to anticipate and respond to the changing market place and customer requirements is one of the great challenges for today's CEOs.*" Successful corporations must design an agile operating model to thrive in today's economy. Agility in the Information Age requires organizations to adopt a different paradigm, mindset, vision, technology, structure, and culture. We term the emerging organizational form as *agile enterprise*.

There are many ways to perceive and conceptually construct today's organizations. You can find many names describing emerging organizational forms in today's business literatures. By adopting a perspective or viewpoint, we are at risk of ignoring other ways of seeing the organization:

"... concepts, theories, and models can never represent or explain the full richness of real social phenomena, we can nevertheless appreciate how apt archetypes can help us see and understand important, often decisive, aspects of reality. Even if their explanatory power is limited, they can nevertheless be of great help and make it possible for us to *analyze problems more accurately* and to *design more functional organizations*" (Groth, 1999; p. 360; *emphasis added*).

Each concept sensitizes us to a limited set of critical elements while ignoring other, possibly, equally important elements. How we represent and conceptualize a business "*often facilitates analysis and communication of a change*" (Weill and Vitale,

2001; p. 30). Images of organization are “*interpretive constructs or ways of seeing... also provide frameworks for action*” (Morgan, 1986; p. 343). The concept of *agile enterprise* sensitizes us to the fundamentals of today’s business environment—namely higher velocity of change—and the key to survival is the ability to adapt to the changes in *real-time*. It adopts the open system/environmental model, where environmental forces significantly influence the organizational structures, strategy, and success (Jaffee, 2001). In addition, the concept accentuates the imperativeness of continuous anticipation, sensitization, and reaction to industry dynamics, in order to gain and sustain organic growth. At the same time, it also emphasizes the role of innovation in carving, entrenching, and extending leadership niches in the industry ecosystem. It stretches our spectrum of possibilities as we strive to build enduring organizations.

Disruptive forces such as globalization, digitization, deregulation, and customerization stimulate organizational mutation over time. Miles and Snow (1984) describe the process of syncing with the business environment for competitiveness as achieving *strategic fit*. Such fit must occur within and without an organization. Management processes and organizational structure (internal) must be appropriately designed to support the strategy (external). Miles and Snow (1984) explain, “*Fit is a process as well as a state—a dynamic search that seeks to align the organization with its environment and to arrange resources internally in support of that alignment... perfect fit is most often a condition to be striven for rather than accomplished*” (p. 10). The economical, technological and societal state of flux makes perfect fit hard to achieve. Think Heraclitus’s flux doctrine - “You cannot step twice into the same river; for fresh waters are ever flowing in upon you.” This is a manifestation of agility that we call *fit* or *adaptation* to the changes in a business environment. Generally speaking, when the changes are incremental then adaptation is an appropriate response.

Not only adapting, agile enterprises also innovate to exert their influence in the marketplace or innovate in response to the radical changes in the marketplace. This involves the cultivation of vibrant and robust industry ecologies. Well-known ecologies in the IT industry include Microsoft’s Windows, Palm OS, Sony’s PlayStation, and Nintendo’s GameBoy, which are orchestrating and managing through their technological platforms. As IBM stabilized itself in the mid-90s, it began to exert itself and aimed to become the standard-bearer in the IT industry again. It boldly propagated its vision of e-Business, and then took a leadership role by investing billions of dollars in driving forward the open source software. Lately, IBM is embracing the On Demand vision, which is another name for the agile enterprise.

Agility can be attained through a fit/adaptation approach and/or through an innovative approach (refer to Figure 3). We call this the *cause-and-effect* of

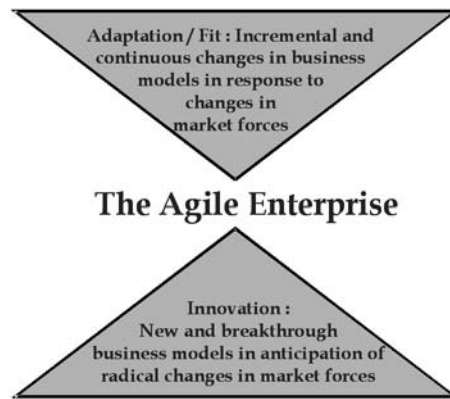


Figure 3. The Balance between Adaptation and Innovation

an agile enterprise. Through its innovative capacity, the enterprise changes the environment and becomes the *cause* of disruption in the marketplace. However, it also reacts to market changes and represents the *effect* of market changes. “*Behavior is a consequence of the context confronting the organization*” (Pfeffer and Slancik, 1997; p. 154). The idea of *cause-and-effect* defines the essence of an agile enterprise; a perpetual cycle of reactive and preemptive behaviors in the marketplace, not only absorbing industry forces, but also generating and emitting disruptive forces in the industry ecosystem. Hence, the agile enterprise needs to effectively strike a balance:

1. Continuously sensing changes in market forces and responding with incremental changes in business models. We call this *adaptation* or *fit*.
2. Anticipating radical changes in market forces and responding with new and breakthrough business models. We call this *innovation*.

However, a higher degree of agility shouldn't imply improvement, greater competitiveness, and *the* formula for corporate longevity. We need to dissipate the tendency and fallacy of assuming that higher level of agility denotes a utopian or end state. An agile enterprise idiosyncratically emerges from the business landscape. It is an *idea* whose time has come; that's why agile behaviors enacted and situated in today's marketplace draw its potency. We should then focus on how to cultivate fertile ground for nurturing the agile behaviors. Our quest is not to uncover detailed predictions but to explain the *form* of agile enterprises in the today's marketplace. Edith Penrose (1959) writes, an organization “*is not an observable object physically separable from other objects, and it is difficult to*

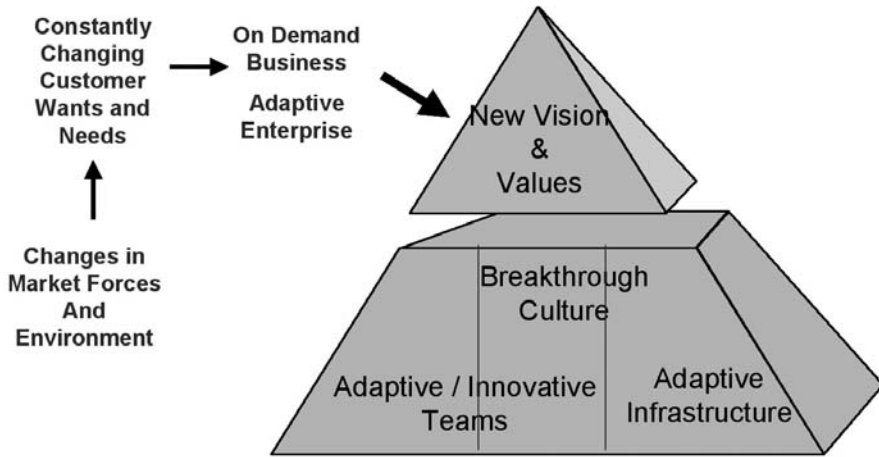


Figure 4. Organizing for Agility

define except with reference to what it does or what is done within it” (p. 10). An agile enterprise is about gaining competitiveness and sustaining growth with the right vision/values, breakthrough culture, adaptive/innovative teams, and adaptive infrastructure (refer to Figure 4), as well as constantly orchestrating these four core components to achieve cohesiveness and innovativeness. We will discuss these elements of an agile enterprise in the following section.

ORGANIZING FOR AGILITY

Traditionally, centralized hierarchies triumph as organizing mechanisms for coordinating processes, allocating resources, and managing complexity (Castells, 2000). Today, we are witnessing the emergence of organizations with a new type of agility. Figure 4 illustrates the core components of the agile enterprise. Environmental forces significantly influence the strategic behaviors of the enterprise. To thrive, businesses need to adopt new vision/values, nurture adaptive/innovative teams, cultivate breakthrough culture and develop adaptive infrastructure.

In today’s marketplace, aligning with industry shifts is made possible by the ability to capture various market signals by using an adaptive IT infrastructure. The emerging agile enterprises are more capable to anticipate and sense the environment as well as respond with more informed decisions and actions in today’s business landscape. The pervasive application of digital technologies to business

processes enables organizations to achieve a new level of agility. The technologies enhance the capabilities and extend the capacities of organizations to accumulate, store, retrieve, analyze, and synthesize greater amount of market signals, data, and information. This effectively expands the boundary of organizational *bounded rationality*. Also, it facilitates organizational collective intelligence to fly in formation to achieve desired business goals. Sawhney *et al.* (2001) elaborates: “*In a connected world, intelligence becomes fluid and modular, floating freely like molecules in the ether, coalescing into temporary bundles whenever and wherever necessary to solve problems*” (p. 6). Across the agile enterprise, intelligence is loosely coupled to create and deliver differentiated values to customers.

In addition to IT, organizations need to craft new visions and customer values, cultivate adaptive/innovative teams, and nurture breakthrough cultures. To move an organization from one state to another, top management needs to adopt new paradigms and mindsets: from linearity to multi-dimensional, vertical integration to on-demand integration, production to co-creation, and value chain to value net (refer to Table 1). This shift is particularly crucial as our mental models of the world around us determine and guide our actions. With the adoption of new models, executives can begin to shape and design the organizations that can thrive in today’s business landscape.

Pre-Digital Age		Digital Age
Linearity	→	Multi-dimensional
Vertical Integration	→	On-demand Integration
Production	→	Co-creation
Homogeneity	→	Diversity
Mass Production	→	Mass Customization
Focus on Costs	→	Focus on Growth
Competition	→	Co-opetition
Bricks-and-Mortar	→	Clicks-and-Mortar
Process Reengineering	→	Process Modularization
Diversified	→	Core Competencies
In-house	→	Outsource
Global by Choice	→	Global by Default
Value Chain	→	Value Net

Table 1. The Transition to Agility in the Global, Digital Age

Agile Enterprise assumes a cohesive whole of visions and values, adaptive infrastructures, adaptive/innovative teams, and breakthrough cultures. The challenge of management is to create and sustain profitability by nurturing and harmonizing the four components. The logic for an emerging agile enterprise is rooted in its interplay.

Visions and Values

A vision statement outlines what an organization aspires to achieve in the marketplace and the nature of values it intends to create and deliver to its customers. It implies a gap between the future state and the present state (Normman, 2001). It provides the framework, in which the logic of existence of the organization resides. The creation of the vision is the intellectual task of the senior management. Transformative change needs to start from the top, responsible for galvanizing the entire organization with a common purpose. Well-known examples are how Lou Gerstner and his management team transformed *out-of-sync* IBM in the 1990s to become today's IT services powerhouse, and how Carlos Ghosn got under the hood of Nissan Motors Co. to overhaul and rev up its competitiveness engines. At Procter & Gamble, we are witnessing how CEO A.G. Lafley is quietly making the 165-year-old company more innovative and responsive to the marketplace. The reconfiguration of organizational DNA requires such strong, dedicated, and committed leadership.

In an agile enterprise, the leadership is crucial in developing a fertile environment or context for agile behaviors to emerge and sustain over time. Leaders need to instill a breakthrough culture, put in place the right teams, and develop an adaptive infrastructure to support business activities. To achieve agility in today's marketplace, the whole organization needs to collectively march together to anticipate and respond to changes. Functional teams and communities of practice across the organization need to share information and work together to achieve the new level of agility. The vision is the lighthouse for every organizational member. Once the vision is created, it must be communicated within the organization so that the vision is committed to and shared by all.

A case in point is IBM's Integrated Supply Chain (ISC) initiative. In 2002, IBM announced the ISC organization led by Bob Moffat. The supply chain handles roughly \$40 billion worth of procurement each year. IBM's On Demand vision and the way the vision is transforming IBM provides the foundation for the ISC vision. *"The vision for the ISC organization is to be the world's first "on demand" supply chain so that IBM can sense and respond to the needs of our customers, interface with our suppliers in that same way, and drive the end-to-end efficiencies and quick responsiveness that IBM CEO Sam Palmisano talks about,"* says Linda Cantwell, Vice President, Business Growth Initiatives, Integrated Supply Chain. Bob Moffat, who runs the Integrated Supply Chain, wants to make sure that all of the 20,000 employees of their ISC organization understand the strategy and the vision, and that they're all marching synergistically to get IBM to achieve that vision. He has been very aggressive about making sure that the ISC vision is communicated to all of their employees around the world so that they understand its spirit and commit to becoming an "on demand supply chain." To IBM and the

ISC leadership there is no end state. It is a journey of continuously innovating and reinventing. They characterize leadership in an agile enterprise.

In addition to vision, an agile organization has to constantly revisit how it will create and deliver value to its customers. This requires an ability and passion to constantly challenge existing products and services, inherent assumptions, and the underlying infrastructure, which includes business processes, information technology, and human resources. In the earlier mentioned IBM's Global CEO Study 2004, a great majority (84 percent) of the CEOs identified revenue growth as the key focus area for their organizations' financial performance over the next three years. Growth strategy should be determined by value propositions but "*precious few companies know themselves (their value propositions) well enough to do it* (Day, 2004; p. 24)." Day went on to group the value propositions into three categories, namely:

1. Price-value leaders like Dell or Wal-Mart. They grow by extending their low cost value propositions to adjacent markets.
2. Performance-value leaders like Medtronic, Intel, or Nokia. They grow by continuous innovation of emerging and converging technologies.
3. Relational-value leaders like Fidelity Investments or IBM Global Services. They grow by providing and extending integrated solutions.

So, if you are in the price-value leader segment as above with players like Dell or Wal-Mart, how do you re-position your value creation and delivery processes to differentiate your products and services? If you do not act fast enough, you may soon become extinct even before you realize it. Many chains like K-Mart had to close down many of their retail shops, as they could not compete with Wal-Mart in the low cost model. We have noted that IBM recently sold its low-end server manufacturing plants to Sanmina Corporation because IBM is simply unable to compete with Dell on the low cost value proposition for high volume products. On the other hand, IBM was reported to be the leader in the high-end server market in the second quarter of 2004. Obviously in this segment of the market, the Big Blue continues to deliver differentiated value. Similarly, if you are in the performance value leader segment like Intel or Nokia, or in the relational value leader segment like IBM Global Services, you need to reexamine your value proposition to improve your competitive positioning.

Therefore re-examining and redefining the value proposition and using that as a basis to develop the vision is a key prerequisite for sustained business performance. The cycle of continuous introspection and reinvention, while maintaining focus on growth and cost control is the management challenge of this age. This is what the agile enterprise is all about.

Breakthrough Culture

Culture describes the collective behavioral tendency of an organization. It characterizes the way organizational members perceive, act, and react to market and operational opportunities and challenges. It is the “*training, improvement, and refinement of mind*” (Webster’s dictionary) and the way the entire organization workforce behaves. For example, in the global, digital economy, people will have to learn how to work in teams (quite often in virtual teams across functional boundaries) and how to work towards common goals with shared commitments across cultural, geographic, and company boundaries. Rosabeth Moss Kanter (2001) uses the term *e-culture* to explain the emerging culture in today’s organizations. According to Kanter, the Web is forcing a fundamental shift “*towards more collaborative work relationships, ones that resemble open, inclusive communities*” (p. 16), and away from the bureaucratic and mechanistic administrative model. Teams will be dynamically formed and disbanded based on the needs of the business, but will be measured and rewarded based on the attainment of common and agreed-upon goals. It is a brand new ball game! We call this collective organization behavior the *Breakthrough Culture*.

In an agile enterprise, breakthrough culture is necessary to anticipate and lead in the volatile, interdependent, and unpredictable global, digital marketplace. It defines and characterizes an agile enterprise’s *bias for action*. This collective behavioral tendency of an organization provides the pillar for the emergence and sustenance of a *bias for agility* over time. We have used a set of attributes to define breakthrough culture, as shown in the table below.

Breakthrough Culture
Open-minded about change
Single-minded customer focus
Collaborative - both within and outside the enterprise
Collective and intensive focus on goals and execution
Top down - management by example
Innovative - for process, product, and services
Learning organization – sharing and creation of organizational knowledge
Service orientation - a service mindset for both internal and external customers
New metrics – incentives for desired behavior

Table 2: Attributes of Breakthrough Culture

Resistance to change is the most important obstacle to overcome when an organization is trying to become agile. When IBM founder, Tom Watson, Sr. started a dress code within IBM with blue suits and white shirts, he did that to conform to the dress codes of his main customers, which at that time were banking institutions. But as IBM's business grew to cover other industries, IBM employees forgot to dress like their customers; instead the blue suits and white shirts became the IBM standard. Only after the 1993 business debacle, when IBM lost close to \$9 billion and a new management team led by Lou Gerstner was installed, did IBM dress code change. One of the authors of this chapter attended an IBM Faculty Summit in mid-2004, where IBM chairman, Sam Palmisano appeared in a sports jacket, which would be unthinkable in the pre-1993 era. Business leaders must develop an organizational culture that is accustomed to continuous change and help their people to adapt to it while relentlessly leveraging that change to their advantage.

Adaptive/Innovative Team

To stimulate growth, Proctor and Gamble powers-up its innovative engines by lubricating intra-company collaboration. Diverse teams and business-units are encouraged to share ideas and talents to roll out products to the marketplace (Sellers, 2004). The entire corporation becomes a networked, collective intelligence, into which its constituents (individuals and teams) can continuously and readily tap to make things happen. In addition to internal intelligence, P&G is also tapping the marketplace for innovative ideas with its 'Connect and Develop' initiative. It is also one of the founding members of *yet2.com*, an interactive marketplace for buyers and sellers of technologies. Bain management consultants Darrel Rigby and Chris Zook describe such an approach as '*open market*' innovation.

Teams across an agile enterprise consciously tap into the collective intelligence inside the organization and in the marketplace for the supply of innovative and progressive ideas. Under the microscope, each of these teams possesses a distinct, cognitive style. Specifically, each has its own Adaptive-Innovative (A-I) profile. Some are more adaptive, while some are more innovative. Dr. Michael Kirton developed the widely used Adaption-Innovation (A-I) Theory, which is applicable for an agile enterprise. The key assumption is that all of us solve problems and are creative (Kirton, 2003), but each of us does so differently from an adaptive-innovative perspective.

By adaption, we refer to *"the characteristic behavior of individuals who, when confronted with a problem, turn to conventional rules, practices and perceptions of the group to which they belong, and drive their ideas towards the solution of the problem"*

from these established procedures". On the other hand, innovation refers to *"the characteristic behavior of individuals who, when confronted with a problem, attempt to reorganize or restructure the problem, and to approach it in a new light, free from any of the customary perceptions which would be conventional starting points for its solution"*.

Neither type is likely to be more or less intelligent, resourceful, creative, or successful. Adaptors are more controlled, practical, prudent, reliable, and collaborative. Innovators are more radical, flexible, independent, risk-taking, and spontaneous. Adaptors are more sensitive to threats from within the systems (devising a downsizing plan, during good times, to right-size resources), whereas innovators tune in to environmental threats (*e.g.* market trends, industry shift, and emerging technological development). Such diverse dispositions are particularly important in today's complex and *edge of chaos* business environment to solve the endless stream of problems and market challenges that arise.

If a team's scope is primarily limited to inside the company activities like manufacturing, production scheduling, etc., then the team's profile should be more Adaptive. If a team's scope is primarily external facing like sales, consulting, etc., then the team's profile should be more Innovative. The most suitable change agent for an Adaptive team would be an Innovative manager. Conversely, the most suitable change agent for an Innovative team would be an Adaptive manager. In an agile enterprise, the critical success factor is to develop an appropriate mix and balance of Adaptive and Innovative teams to maximize agility without compromising efficiency.

Adaptive Infrastructure

Business processes and the supporting information technology are the underpinnings of any infrastructure in terms of its capability. The global CEOs in the IBM study mentioned earlier in this chapter, identified *"creating adaptable processes that allow real-time response"* as one of the top three actions they will take related to agility. The other two areas are:

1. Capture and utilize customer information for swift decisions, and
2. Develop vehicles to capture customer needs and preferences.

All of the three action areas are about business process capabilities. Now, how do you design an adaptable process that allows real time response?

Inclusion

First and foremost is to include all stakeholders into the process. So, if it is a customer-facing process, you should include participation by the customer.

Examples of customer-facing processes include customer order entry, customer order fulfillment, invoicing and bill payment, order status enquiry, product shipment, and many more. Others have tried quite successfully to have customers participate in the new product design and development processes. Companies like Dell, IBM, and many others have created custom Web sites for each of their key customers, so that these special customers can seamlessly do business with them.

Other stakeholders like suppliers or business partners should similarly be included in the processes that have their involvement. When IBM sold off the plants that manufactured low-end servers to Sanmina Corporation, one of the authors of this chapter asked an IBM executive how this is going to work from the customer's viewpoint. His response was that the customer is not going to see any difference because the processing needs of Sanmina Corporation had been incorporated within IBM's order scheduling and customer fulfillment processes.

Governance

Before IBM transformed into a global operation, every country and business unit used to have its own set of key business processes and applications. But after the largest loss in corporate history in 1993, IBM slowly transformed, and now has only one set of key business processes across all countries and business units. There is one global process owner, who is a senior business executive and is responsible for the performance of his/her assigned business process across all geographies. He/she also owns the supporting business applications. Each owner has a goal for their assigned processes to attain industry benchmark, in terms of agility and efficiency, and is measured and rewarded accordingly. For example, Bob Moffat, referred to earlier in this chapter, is the global owner of IBM's integrated supply chain process, and is responsible for its performance across the world.

This single point of ownership gives IBM process owners the span of control necessary for the task at hand, which is to achieve or exceed industry benchmarks in terms of agility and efficiency.

Technology Infrastructure

Technology acts both as an enabler and a transformer. The advent and adoption of the Internet and related technologies in the 1990s and now wireless and associated technologies have enabled many new and revolutionary changes in the way we do business. But for many organizations, disparate and heritage business applications have proven to be an enormous challenge to surmount. There is an urgent need in many organizations to harmonize, standardize, integrate, and consolidate disparate information technology infrastructures. Most often it requires organizations to move to an entirely new technology base to make it work. Therefore, it is important to carefully choose which technologies will make the real difference, invest only in those technologies, and stay focused.

Furthermore, there is always the debate about whether it is prudent to develop the solutions in-house or to buy it from others. Do you develop an enterprise resource-planning suite of applications by yourself or buy it from SAP? Do you develop your CRM solution or buy it from Siebel or SAP? Do you develop your own custom databases or buy it from IBM or Oracle? Studies have shown that buying it is better, in most cases, than making it. One executive recently commented while talking about procuring an ERP solution from a vendor, *"It is easier to shift the corporate office building by three feet to the left than to develop your own ERP solution."*

The other aspect of technology, as identified by the global CEOs in the IBM study, is to capture and utilize all information associated with customers to understand their changing needs and preferences for swift decisions.

Process Innovation

Business processes are the underpinning of how value is created and delivered. Much has been written about the digitization of processes and the value derived. Most legendary has been GE's effort started in 1999 by their then CEO, Jack Welch, to digitize "every aspect of the company". In 2001, he writes in his autobiography, *"I don't think there's been anything more important and wide-spread in all my years at GE."* GE reported enormous amounts of savings from their process innovation and digitization efforts.

A quick point to add here is that if you simply digitize a process without examining how value is created in today's context, thereby transforming the process with innovating ways, you will simply be doing "bad" things faster. Therefore, to implement process innovation, you have to deconstruct the process into its constituent modules, and then examine each module in the context of your current business to see if and how this module is adding value. If it is not adding value, it surely is adding to your cost and waste.

However, before making radical changes to a business process, it is always good to ask, *"Will the market buy it?"* Sometimes it is better to make incremental changes. The example from Schwab is a case in point. In the mid-nineties, they created a new organization called eSchwab. Established Schwab customers had to become new customers of eSchwab to deal with them on the Web. In 1998, and against prevailing conventional wisdom, Schwab decided to merge the two operations allowing their customers to deal with them via the telephone and the Web. So, even though creating an online subsidiary looked like a radical change, they quickly realized that it was not what the market wanted and swiftly changed course, which resulted in Schwab becoming one of the largest brokerage businesses in North America. On the other hand, Webvan, for example, came up with a radical business model for online grocery shopping, but did not understand what the market wanted and was soon extinct.

CONCLUSION

In a marketplace characterized by discontinuous change, yesterday's successes don't correlate convincingly and strongly with tomorrow's successes. We believe the agile enterprise enables us to rethink the way businesses create and deliver values in today's marketplace. The concept sensitizes us to key elements, enables us to analyze them, and subsequently provides us with insights to achieve our objectives. It reduces complexities and deduces a representation from the complex world. It is instructive to use the enquiry into agile enterprise as a platform to advance our understanding of organizations in the global, digital economy.

Organizations have no choice but to reexamine their value creation and delivery models to recreate their vision and value propositions. Developing a breakthrough culture that can withstand change should support this. Careful consideration should be given to form teams with members having an appropriate mixture of innovative and adaptive skills that will vary from process to process. As discussed earlier in this chapter, a supportive infrastructure of business processes and information technology should be adaptive to changes. The fortunes of many of the best-known companies of today will rise or fall depending on how agile they are in anticipating, sensing, and responding to what is shaping up to be a period of perpetual and rapid change. The agile enterprise is, indeed, the organizing paradigm of the global, competitive marketplace.

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3

SERVICES ARE THE LANGUAGE AND BUILDING BLOCKS OF AN AGILE ENTERPRISE



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INTRODUCTION

In the 1920s and 30s, companies on the Standard & Poor Index remained on the list, on average, for about sixty-five years. Today, Foster and Kaplan report that the average time on the S&P Index is roughly ten years (2001, p.13). Over the last fifty years the average product lifespan in pharmaceuticals, toys, cosmetics, and food items has decreased by two-thirds. For example, products with a lifespan of twenty years now have an average useful sales life of seven. Even more jarring, a six-month delay in product introduction in these areas can represent greater than a 30% reduction of lifetime product revenue (Foster and Kaplan, 2001). Clearly, business agility—the ability to sense change and opportunity in the marketplace, respond quickly, and execute successfully—has become a new strategic imperative.

So what is an Agile Enterprise? How can it be defined? How would it be measured? How is it different than a non-agile enterprise? How does it deliver value to its customers? We will consider each of these questions and conclude

by recommending an approach for an evolutionary transformation to an Agile Enterprise that we call *Aligning the Tactical for Strategic Intent*.

What is an Agile Enterprise?

How *Agile Enterprise* is defined depends upon your perspective. From the perspective of the market, an Agile Enterprise is one that financially outperforms competitors and the market as a whole over the long term. Such a metric provides the ultimate yardstick for a company but unfortunately does not yield a blueprint concerning the structure or operations of a company desiring to be agile. Nevertheless, this market view of agility highlights the notion that agility is more than the ability to change *once*. Rather, agility is the sustained ability to sense and respond to change after change, executing well, occasionally inflicting change on one's competitors, and yielding market-leading returns. (Foster and Kaplan, 2001, chapter 2)

Business strategists often speak from the perspective of vision. Agile Enterprises need to be able to see around corners in order to anticipate and lead and sense what's next. Certainly the ability to anticipate change is very important but, in and of itself, it is not sufficient to guarantee agility.

Vendors often speak from the perspective of components. They speak about agility in terms of biology or mechanics using phrases such as *adaptive*, *self-healing*, *autonomic*, *self-adjusting*, or *dynamic*. These are useful terms in describing the relationships between business processes and between business processes and the supporting IT environment. Just as with the market-based view, however, this component-based view does not yield a clear prescription on how to organize or operate an Agile Enterprise.

Not surprisingly, technologists often view agility from the perspective of automation. Agility is often defined using phrases such as *virtualization*, SOAs (service-oriented architectures), process models, and model-driven architectures. These terms begin to provide some actual, physical *puzzle pieces* but still do not provide a clear explanation of the whole picture.

CFOs and purchasing agents provide yet another part of the puzzle, looking at agility from the perspective of cash flow and capital commitment for acquisition of goods and services. This community refers to agility using phrases such as *pay-per-use*, *on-demand*, *out-tasking*, or *strategic sourcing*.

Each of these five perspectives—market, business strategist, vendor, technologist, and CFO—is valid and useful. What is needed, however, is a holistic view of business agility, one that identifies the commonalities rather than the differences between these perspectives. For an athlete, agility is not just

speed or flexibility or strength or superior sense of direction. Rather, agility is the product of all of these factors. So it is with business agility. Agility does not come from any one *dot*, any single component, capability, or perspective. Agility comes from how the dots are connected.

Just as the term Agile Enterprise implies, each of the perspectives has meaning within the context of a single enterprise. For an enterprise, agility can be defined and measured in terms of improving the cycle time for managerial action. This cycle time can be broken into three components (sense-decide-respond) across four time periods:

- Sense: how long does it take to sense a need or change in conditions
- Decide: how long does it take to make a decision
- Respond: how long does it take to make a change and returning to the beginning of the cycle
- Sense: how long does it take to validate the outcome of the change?

Understanding action cycle time latencies helps identify where the agility bottlenecks or hot-spots are occurring and can provide the basis for dramatic improvements in the enterprise's ability to create, deploy, and retire services offered to the marketplace (see Figure 1). Efficiencies and improvements can be found in all areas of the business: supply chain flexibility, inventory turns, customer management, and demand chain processes. Being able to measure cycle time latencies for each component (sense-decide-respond) individually or



Figure 1.

across all three in an aggregated fashion would yield significant insight into an enterprise's agility.

Hewlett-Packard recently introduced a methodology of measuring business agility in different industries using the aggregated metrics of time, range, and ease: how long does it take to make a change; over what range or scope can the change be implemented; and how easy or difficult is it (ultimately, cost) to implement the change (HP Agility Assessment). Using these metrics as a comparison to industry peers provides a very valuable market-based agility benchmark and provides the basis for a go-forward action plan.

Certainly, each of the three components (sense-decide-respond) of managerial cycle time is critical to agility. Quality of information, business intelligence and analytics, and feedback mechanisms are critical to *sensing*. Robustness of governance structures and leadership capabilities are critical to *deciding*. However, it is the ability to respond and make changes quickly that ultimately determines agility.

The day after September 11th 2001, an executive committee at Zara, a European clothing designer and retailer, met to determine how the attacks would affect their business. They believed that Western Europe and North America would enter a period of mourning. Implementing change quickly in their supply chain, Zara was able to change from equestrian themed clothing to black colored clothing within 10 days resulting in double-digit sales growth in the quarter (Columbia University Case Study, 2002). In North America in 2002 conversely, a large clothing retailer struggled to cope with the effect of SARS in China. SARS greatly affected their supply chain because Chinese textile workers were not reporting for work. Unfortunately the retailer could not affect the supply chain quickly to bring alternate suppliers on board and the stock of goods on the shelves dwindled in the short term.

Common to the five perspectives and three components of agility is the observation that Agile Enterprises identify value from their customers' point of view and respond by providing that value in a form that best meets customers' needs and expectations. We believe providing that value as formalized services is the best way to stay in synch with customers' needs and expectations. Let's explore the role services play in an Agile Enterprise.

AGILE ENTERPRISES DELIVER VALUE IN THE FORM OF SERVICES

A fundamental precept of services is that the customer is the judge of the value. It is critically important to deliver value, internally and externally, as services because services are the customer-driven governance mechanism of an Agile Enterprise.

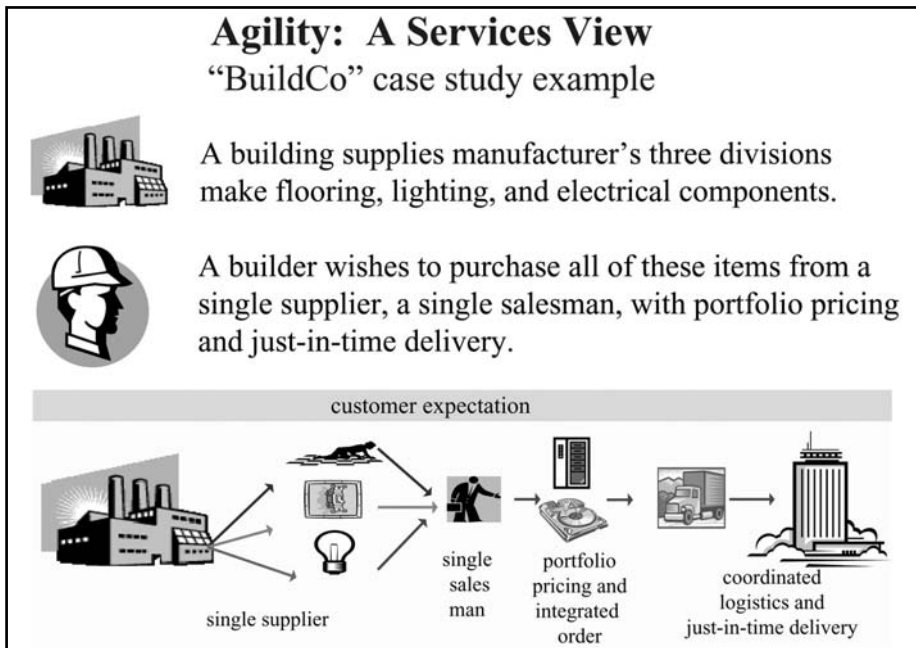


Figure 2.

When the enterprise has it right, the services created and delivered to both internal and external customers will deliver the value customers seek and the key performance indicators of the business will be met. When the enterprise has its value proposition wrong, internal and external customers will serve as the *early warning mechanism*, the feedback loop.

Thus, formalized services provide a built-in mechanism for enterprises to sense (as in *sense-decide-respond*) customer reaction to the offered value proposition.

Most importantly, however, delivering value as formalized services will force the enterprise to structure processes and infrastructure modularly and flexibly in order to be able to respond quickly and deliver value in a timely fashion to customers.

Let’s consider the case of *BuildCo*, an amalgam of several of our real manufacturing clients created for illustrative purposes. BuildCo, in Figure 2, is a building supplies manufacturer that makes flooring, lighting, and electrical components such as fuse boxes, switches, and conduit. This company grew over time, partly by acquisition, and is organized into three divisions—one for each main product line.

BuildCo sells through the distribution channel as well as directly to large corporate construction firms. As with many companies, IT automation has grown over time with new systems being installed on a project-by-project basis. In the case of BuildCo, each division installed its’ own ERP systems, manufacturing

control systems, etc. This is not unusual. Many companies have multiple systems that perform the same or similar functions.

Now, let's introduce a builder who has won a contract to build a new office headquarters for a prestigious client. The builder wishes to purchase all of these items (flooring, lighting, and electrical) from a single supplier, a single salesman and receive portfolio pricing and just-in-time delivery to the job site.

The business process flow desired by the customer (the builder) can be seen at the bottom of the diagram in Figure 2. Notice, that the customer's expectation is that the business transaction be optimized and smooth. In fact, getting the order right and delivering the materials in the right sequence and just in time are probably of greater value to the builder than the materials themselves. (The materials themselves are likely a commodity available from multiple suppliers.) Delivering information about the materials and transaction (order and delivery status, billing information) across multiple channels (phone, web, mail) likely adds additional value for the builder. Focusing on only the materials themselves (quality, price, etc), BuildCo would be seriously misreading perhaps its most important value proposition.

Now, let's look at what really happens, inside BuildCo to support this customer transaction, in Figure 3,. Each division has its own supply chain, its own sales processes and its own distribution and logistics systems and IT infrastructure (servers, storage, databases, etc.) and processes.

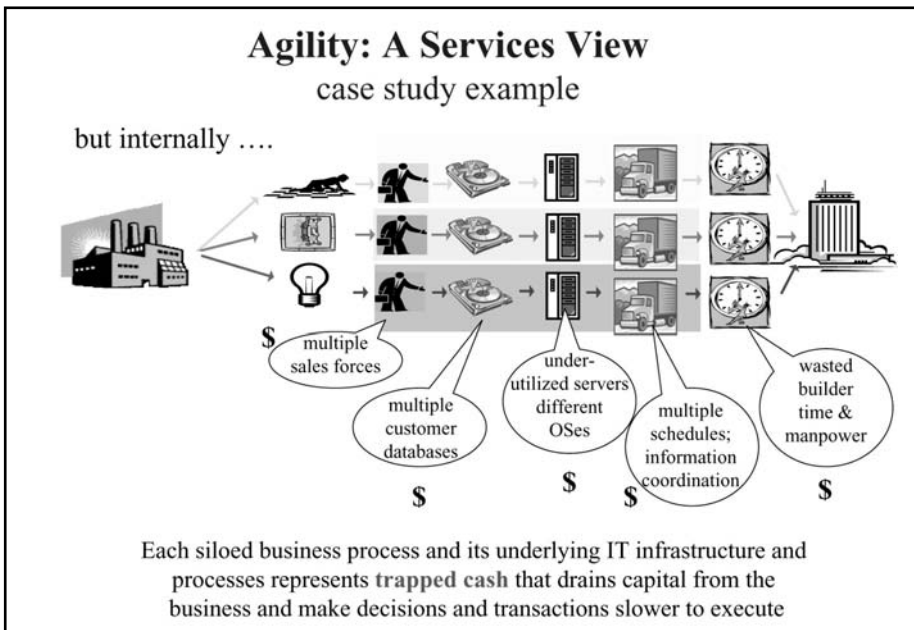


Figure 3.

Each siloed business process and associated underlying IT infrastructure and processes represents trapped cash that drains money from BuildCo and makes business decisions such as supply management, production planning, and portfolio pricing more difficult. Even more telling is what must occur inside BuildCo if the builder calls with a change of order. Each silo and its supporting processes and systems may be affected. Changes will take time to coordinate and will likely be expensive to accommodate. BuildCo's business processes and its support automation infrastructure are so siloed; it is very difficult to flex, to adapt, and to move quickly. Clearly, BuildCo's processes and infrastructure need to be aligned and synchronized with the expectations of its customers and marketplace.

An excellent example of improving market position by increasing the services-based value proposition of their marketplace offering is the Hyundai Motor Company. Through the 1990s, Hyundai in the U.S. had a reputation for poor quality and was suffering from weak sales. By increasing the warranty period to ten years and 100,000 miles, Hyundai significantly increased the value of their deliverables and increased sales by 6.7% in 2003 (Bloomberg News Service, 2004). From a product perspective, Hyundai was just selling cars against dozens of other vendors. By adding services-based deliverables (ten year warranty guaranteeing free repairs), Hyundai was able to differentiate its value proposition in the market. Essentially, Hyundai began to offer an improved service—namely access to transportation resources, guaranteed to work, at a price below competitors.

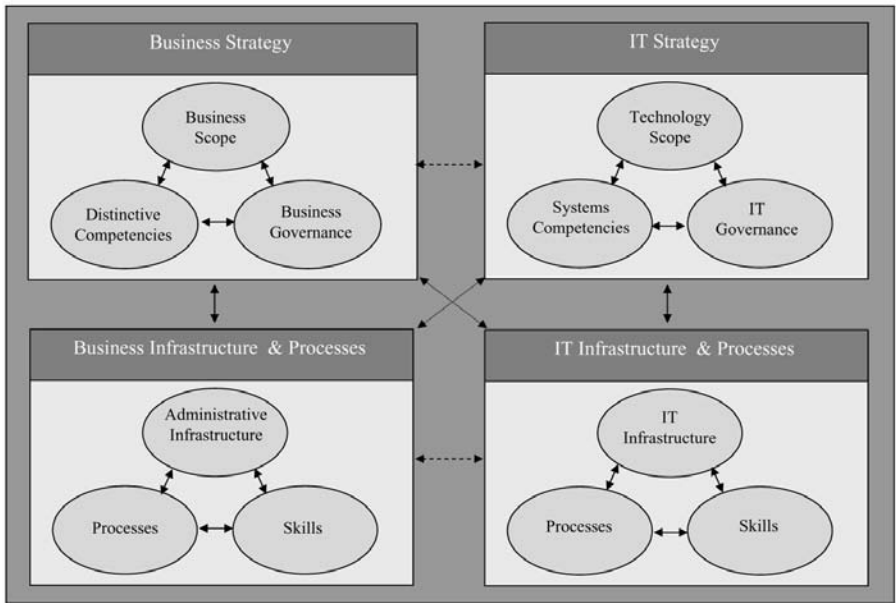
As we have seen, being an Agile Enterprise means outperforming industry peers and the market over the long term. Being able to sense, decide, and respond to changing market and business trends and conditions is what does this. Clearly, the best way to do this is to maintain constant alignment with customers and the marketplace. The concept of a customer-first, *customer-in* (versus a *corporate-out*) perspective has been well documented in the business literature.

What is not generally understood, however, is that architecting, creating, and delivering value as a set of formalized services is the *best* way to become and remain agile. Agile Enterprises deliver formalized services inside the enterprise as well as externally, to customers, suppliers, and partners. Identifying the strategic set of formalized services that customers want begins with solid relationships.

Services Redefine the Relationship Between Business and IT

"Every business decision triggers an IT event," noted the late Bob Napier, HP CIO in 2002 & 2003. "If you get the infrastructure right, everything is possible." The converse is unfortunately also true. Without flexibility and modularity in the

Business to IT Strategic Alignment Model



Venkatraman, Henderson, Oldach

Figure 4.

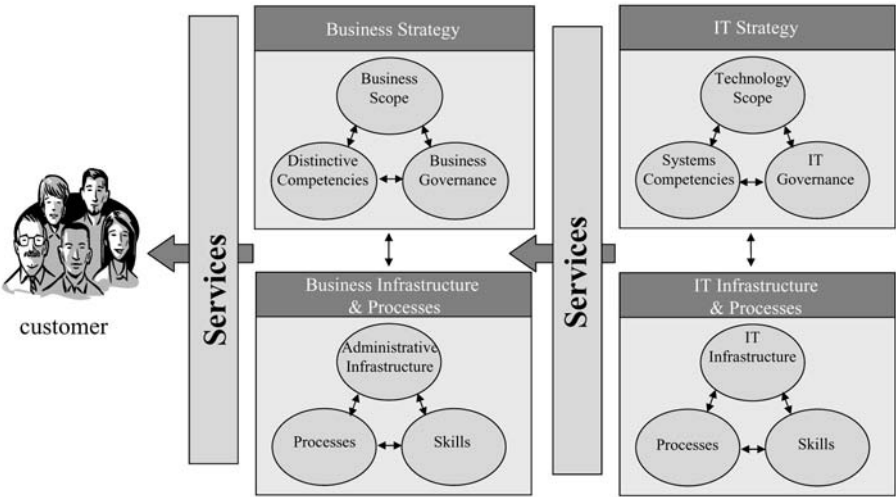


Figure 5.

IT infrastructure and environment to automate and support the to-be-changed business processes, many desired business decisions are too costly, too slow, or downright impossible to execute. Clearly the alignment and relationship between business and IT plays a key role in the question of agility.

Nearly every CIO survey over the past decade has listed *business-IT alignment* as a strategic imperative. But what is *alignment*? How is it measured? How do you know when a business and its customers and business and IT first become *not aligned*? How often must alignment be checked? All are good questions. Clearly we need a model and a language to describe alignment.

In 1993, Venkatraman, Henderson and Oldach published a strategic alignment model for aligning business and IT strategies (Figure 4). Venkatraman suggests that there are two reasons why value from IT investments is difficult to realize. First is the lack of alignment between the business and IT strategies. Second is the lack of a dynamic administrative process to continually check whether or not alignment was still present (Venkatraman, 2004).

Formalized services, by their very nature, solve both problems. This is because delivering value as formalized services fundamentally alters the nature of relationships: business to IT relationships as well as business to customer relationships.

We can slightly alter Venkatraman's model by using formalized services as the interface between business and IT strategies and between customers and companies. With this modification, IT now delivers formalized services to the business and the business delivers services to its customers as well as its suppliers and partners (see Figure 5).

By looking at the lifecycle of a formalized service in Figure 6, we can decompose the strategic alignment model a bit further. We can begin to see the relationships between:

- Business strategy and (business infrastructure and processes)
- (Business infrastructure and processes) and IT strategy
- IT strategy and (IT infrastructure and processes)
- (IT infrastructure and processes) and the business

in terms of how formalized services are defined, designed, developed, and delivered.

Using formalized services as the common language spoken both by the business and by IT is the key to continual business-IT alignment or synchronization.

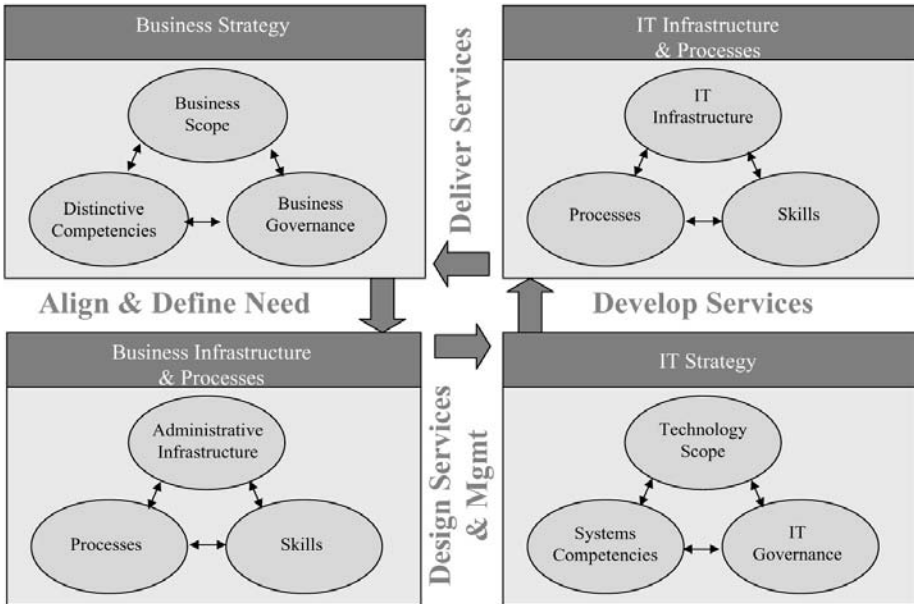


Figure 6.

THE ARCHITECTURE OF AGILITY: SERVICES ARE THE BUILDING BLOCKS OF AN AGILE ENTERPRISE

HP has developed the *Darwin Architecture*, which is a set of models, principles, and design rules that are used to construct an Agile Enterprise (or in HP terms, an *Adaptive Enterprise*). As can be seen in Figure 7, services play a key role in the Darwin model.

There are a number of key features and concepts in Darwin worth noting. First, business value is created when value is delivered to a customer. While resources may be invested in management, infrastructure, applications, etc. throughout the enterprise, the only measure that ultimately matters is that of the customers. All investments and all decisions—architectural and otherwise—must be grounded in the guiding principle that customers are the consumers of the business services created by the enterprise and hence are the judge of the value.

Second is the realization that Darwin is not a *technical architecture*. It does not prescribe the use of particular technologies, middleware, or applications such as .NET, J2EE, Unix, Windows, SAP, WebSphere, Oracle or SQL Server. Rather, HP's Darwin Architecture describes the capabilities, relationships, and principles (simplification, standardization, modularity, and integration) required to build

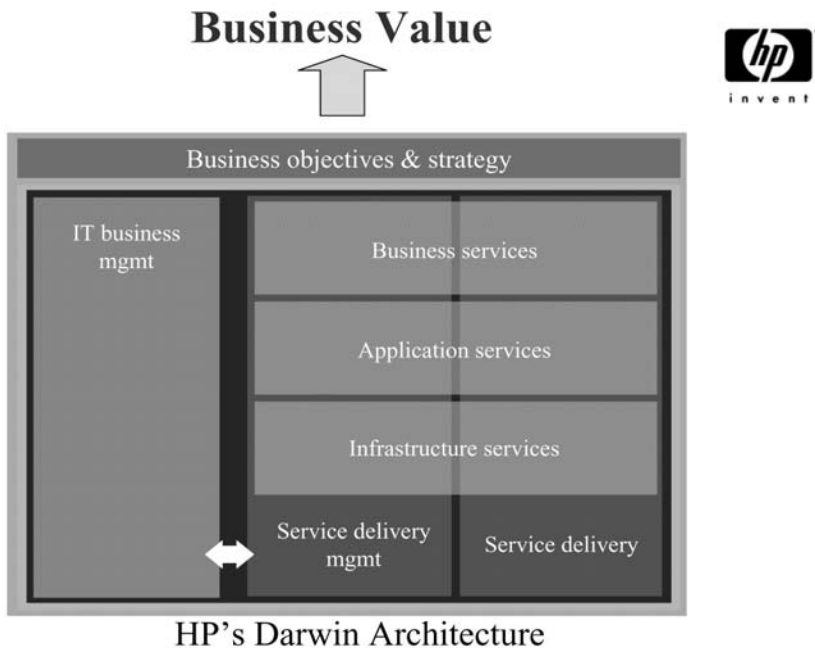


Figure 7.

and maintain agility. Darwin guides key decisions preventing organizations from being locked into or held up by hidden proprietary control points. Darwin focuses on the *agility relationships* between components—how the components and elements of the enterprise need to inter-relate with one another in order to maintain the ability to change quickly.

Third, you will notice that formalized services play an essential role in the Darwin architecture. There are three primary layers of services: business services, application services and infrastructure services. These layers are organized as horizontal sets of functions that are delivered to the next layer above as a set of formalized services. Each layer is:

- Self contained
- Performs defined functions
- Delivers its value as a set of services through defined interfaces and protocols to the next layer above

(For technical readers, these are also the key characteristics of the OSI seven-layer telecomm stack.)

Fourth, the Darwin model emphasizes that the real function of IT is to automate business processes, not just to run hardware. Over the past twenty years,

IT infrastructures migrated from monolithic mainframes to off-the-shelf software running on distributed systems. This shift brought autonomy and responsibility for planning to the Lines of Business (LOBs) and in many enterprises the IT organization became increasingly relegated to a technology operations and support role. This trend is reversed for an Agile Enterprise. For an enterprise to be agile, planning for and within each LOB must be done within the larger context of the goals, standards, resources, and methodologies of the enterprise.

Fifth, agility comes from being able to compose and recompose services quickly. For this to be true, the services must be built from modular components that can be combined and recombined on an as-needed basis. It is this capability that is referred to in the IT press as *service oriented architecture*.

Sixth, upper layer services (the business services in the Darwin model) are composed of lower-level services (application and infrastructure services in the Darwin model). In this way, each end business service delivered to an external customer (or supplier or partner) is built by combining lower level services in building-block fashion.

Lastly, services delivered to external customers are composed of multiple lower-level services that are delivered to internal customers. This means that Agile Enterprises are composed of many service provider-to-customer relationships. Relationships are critically important in an Agile Enterprise. In fact, it is the quality of the relationships between IT and the business and between the enterprise and its customers that determine what services customers will purchase from the enterprise.

While a further detailed decomposition of the Darwin model is beyond the scope of this discussion, it is important to formally define the term *service*.

What's a Service?

The first reaction we receive when these concepts are presented to a client is, "Absolutely! That is why we consider ourselves a provider of services." It becomes quickly evident, however, that we must back up and define what we mean by services.

Service is a widely used term in our language. We are used to hearing the term so often we rarely think carefully about it. We hear it in the media and industry press often: "We are a service-oriented culture," or "We are shifting to a services-based economy," etc. In fact, the term service has multiple meanings in our language as illustrated in the following sentences:

- We got great service at the restaurant. (service = attentiveness to needs)
- We received lovely place settings, service for eight. (service = silverware)

- I get my car serviced at the car dealer. (service = maintained)
- HP is our managed service provider. (service = outsourcing)
- In 1972, I was drafted into the military service. (service = Armed Forces)
- I use FedEx's overnight delivery service.

The last sentence, the FedEx example, captures the meaning of service required by Agile Enterprises. Value delivered in the form of services is much more modular and flexible than value delivered in the form of products. For example, FedEx can vary delivery guarantees so as to create multiple, differentiated value propositions for its customers. We can see this in the four required characteristics of a formalized service. All formalized services, no matter what they are, have these four required characteristics in common:

- Defined deliverables (can have product and process components)
- Measured and reported quality
- Defined price
- Value is judged by the customer

Upon reflection, you can see that the first, second, and third characteristics are tunable to help meet varying customer and market conditions:

- Defined deliverables

Customer value is much easier to increase or decrease if the deliverables include both product-based and services-based value. This is true even if there is a significant or even majority percentage of product-based value as part of the overall set of deliverables. Recall how Hyundai, in an earlier example, dramatically increased their value proposition to the market by improving the services content of their cars. Another example is General Motors, who is increasing the value proposition of their vehicles with their set of OnStarTM services.

- Measured and reported quality

Both the quality and quantity of information reported to customers can be tuned as way to increase value and competitive position. In the case of Hyundai, improved warranties not only served as a sales incentive and a way to improve customer relationships but also

provided a closed-loop communication channel back to engineering so that product and internal process improvements could be made.

- Defined price

Product-based costs are difficult to decrease. The content and price of associated services-based deliverables, however, are easier to negotiate and adjust with both customers and suppliers.

It is the fourth and last characteristic of a service (customers are the judge of the value), however, that ultimately differentiates corporation-out from customer-in organizations and processes from services.

Processes versus Services

The table in Figure 8 highlights the differences between processes and services. These differences are significant because Agile Enterprises must always place priority on services—i.e. customer-facing value (customers can be either internal or external to the organization). Focusing only on internal processes leaves organizations much too vulnerable to ignoring customer and market needs in

Differences Between Processes and Services		
Characteristic	Processes sometimes referred to as functions	Services
cohesive set of activities	yes	yes
designed to achieve predefined results	yes	yes
results defined as ...	process outputs	customer deliverables
recipient / consumer of the results	inside or outside the supplier 's organizational sphere	outside the supplier 's organizational sphere
measured and reported quality	desired, not required	required
defined price	desired, not required	required
measures and accountability	done internally Internal metrics used	done externally customer metrics used

Figure 8.

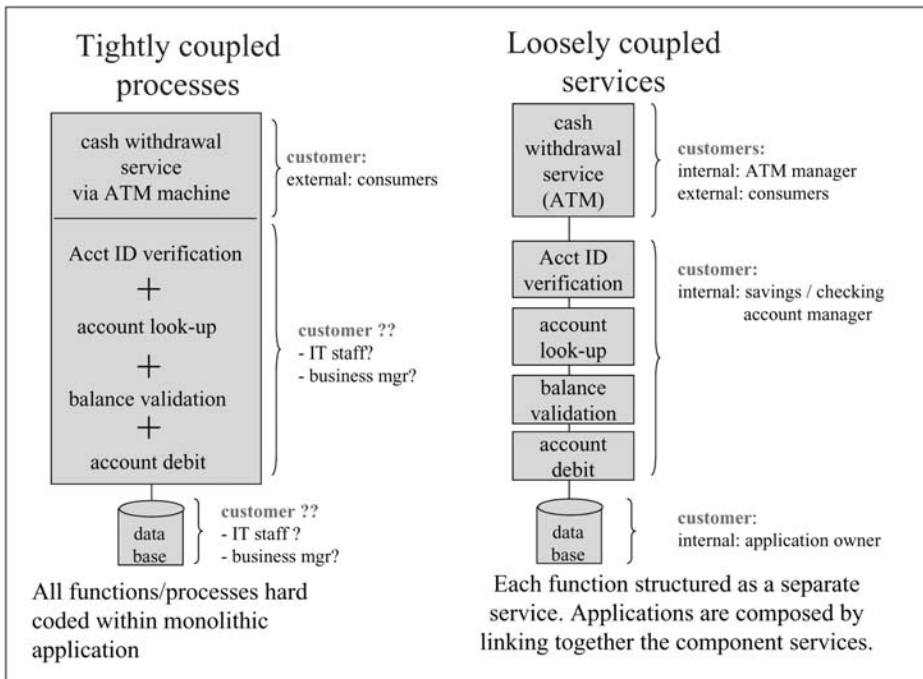


Figure 9.

favor of process adherence. Of course, processes are components of services but it is the formalized customer interface that differentiates the two.

Examining the chart, it becomes clear that the biggest difference is that services have a formalized customer interface whereas processes (or functions) have an informal customer interface. It is the formality of this interface—the *value delivery boundary*—that makes services crucial to Agile Enterprises.

These ideas can be easily seen when thinking about an ATM machine. The service to the external customer, the consumer, is the cash withdrawal service. This service is composed of multiple functions or processes such as *account lookup*, *identification verification*, and *balance validation*. These functions or processes typically reside within an application created for the purpose of supporting the cash withdrawal service of the ATM machine. These processes are shown on the left side of Figure 9.

On the right side of Figure 9, you can see the same functionality being provided in the form of modular, loosely coupled, formally defined services. Providing value in the form of services means that there are now multiple customers—internal and external. For example, the ATM manager is the customer of the checking / savings accounts manager. Because there are multiple customer-provider relationships, there is clear accountability throughout the entire value chain. Needs and

opportunities will be monitored more closely and understood more quickly. This modularization also allows changes to be made much more easily and quickly to each individual service while protecting the integrity of the functionality of the other services.

Let's extend our ATM example by supposing that the bank wishes to partner with a cellular phone service provider to extend their banking services across a wider business ecosystem. Suppose that the cellular company wishes to offer their customers the ability to purchase items using their cell phone instead of a credit card: a cellular debit card service. (This is already happening in Japan.)

If the cash withdrawal service offered at the ATM machine has been designed and hard-coded with standalone infrastructure and software application (i.e. in a vertical silo), then the code will have to be duplicated and modified and run on its own separate siloed infrastructure. The ability to execute this change, then, will be slowed and will be more expensive. If, however, the service has been created out of smaller, stand-alone, modular services (as identified above, such as identification verification, etc.) then it would be relatively easy and inexpensive to build and offer the new cellular debit card service by layering wireless access and security services on top of the lower level services supporting the cash withdrawal service already being offered via the ATM machine. Now, as seen in Figure 10, the cell phone simply becomes an alternate access device for the cash withdrawal service.

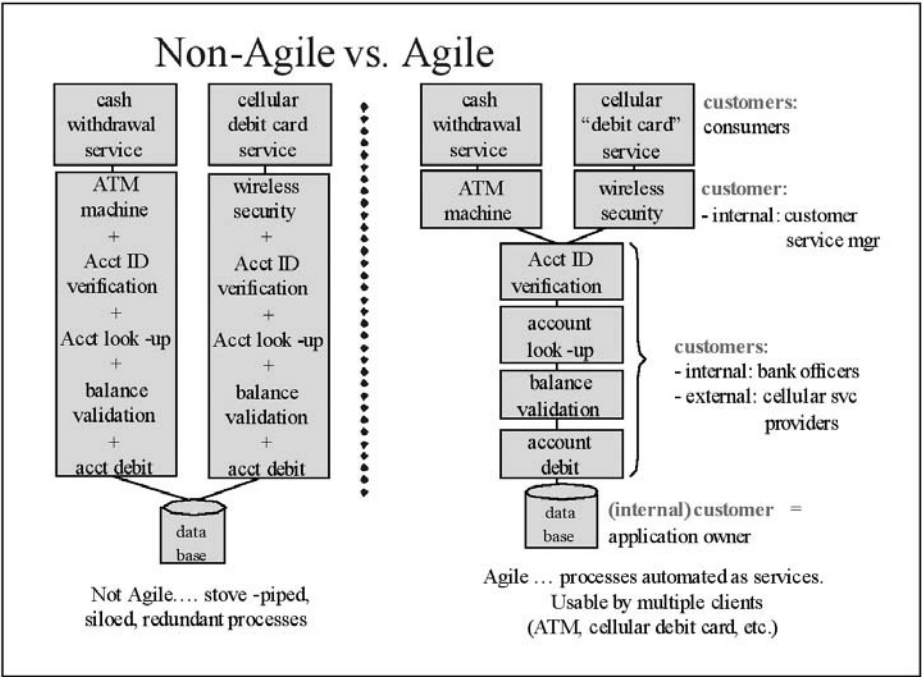


Figure 10.

Mapping Cellular-Debit-Card Solution to the Darwin Architecture

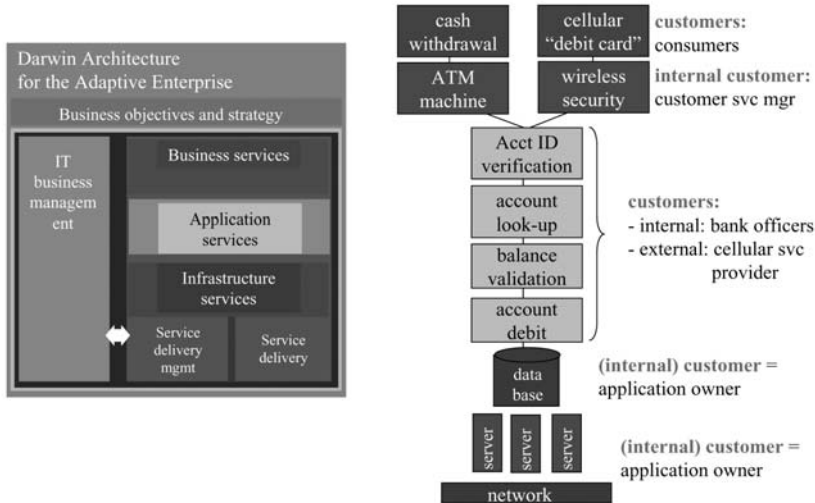


Figure 11.

(For an excellent discussion of *service platforms* used for multi-channel delivery of services please see *Services Blueprint: Roadmap for Execution* by Ravi Kalakota and Marcia Robinson, 2003).

As can be seen from this example, now formalized services are being delivered to both internal and external customers. For the sake of completeness, let's map the solution architecture of the cellular-debit card service back to HP's Darwin Architecture.

In Figure 11, the individual services of the cellular-debit-card solution are color-coded to demonstrate the linkage back to the generalized Darwin Architecture.

The ATM example illustrates how various services are built *bottom-up* in Darwin Architecture. Higher-level business services are composed of application services. Application services are composed of lower-level infrastructure services. In this way, lower and mid-level infrastructure and application services can be combined and re-combined to quickly produce multiple business services that meet business needs and bring new value to customers.

The ATM example also showed that there are different customers of the services at the different Darwin levels. Let's revisit our definition of formalized services and define a *services maturity model* in terms of the value being delivered and the customers consuming that value.

Building an IT Service Maturity Model

The ability to extend and link business processes in a modular fashion across the boundaries of the enterprise is a hallmark of *agility maturity*. Using this service maturity model, we could say that, with regard to the cellular-debit-card and ATM services, the bank was agile (adaptive, level 4/5) if it could modularly link the new wireless access and security services to the pre-existing lower level services (such as account look-up, ID verification, etc.) and thus offer the new cellular debit card service quickly without having to replicate any functionality.

Alternately, if the bank had to create additional instances of the lower level functions using additional copies of the applications and run the new cellular debit card service on its own IT infrastructure, then the bank could hardly be considered agile or adaptive; costs would rise and any future changes to the lower level services would have to be made multiple times, in multiple places. Future changes would be slowed and be more expensive to implement. In this circumstance, the service maturity would be level one or two, depending on the level of efficiency and quality of service the IT organization was delivering to the business (see Figure 12).

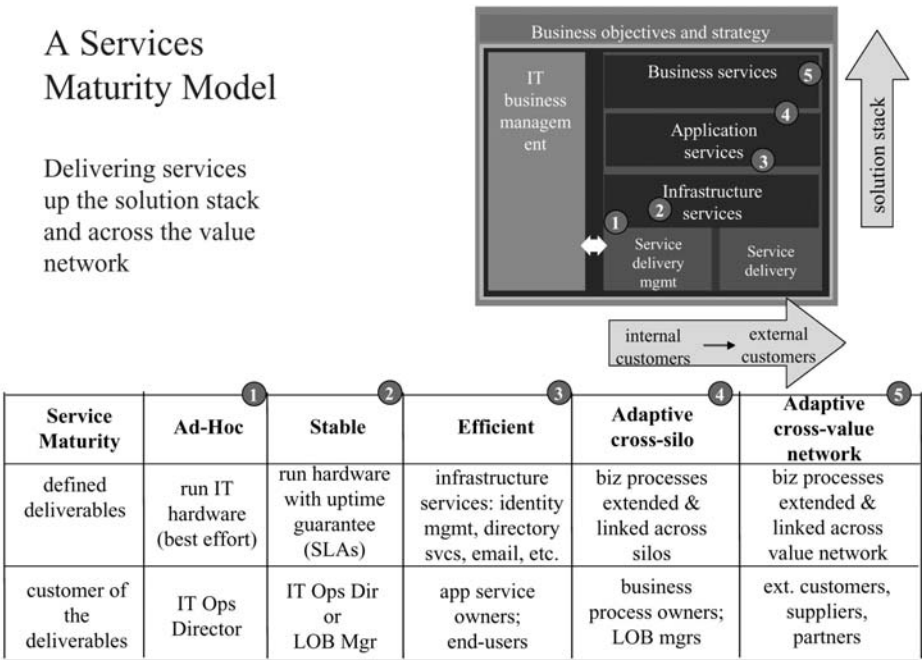
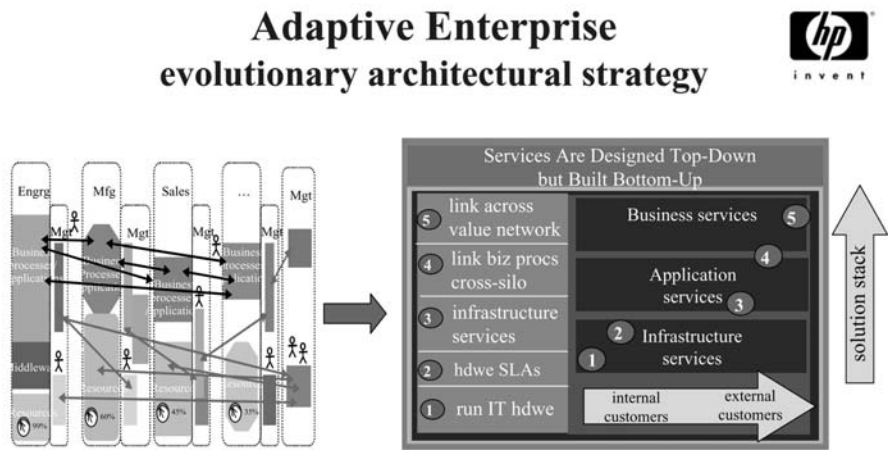


Figure 12.

There is another major business benefit in delivering each of the functions in the solution stack as formalized services, rather than just as internal processes. Namely, it would now be possible for the bank to understand the unit transaction cost of each service in the solution stack. It would be very easy, then, for the bank to compare the costs and benefits of delivering the cash withdrawal service or account debiting service via ATM, cellular debit card, teller, or some other alternate method—even on an individual customer basis. Understanding component services cost, modularity, and insight into customer and market behavior are all contributing factors of business agility.

ARCHITECTURAL CHANGE

Delivering value as a set of services, at each layer of the Darwin model, requires a great deal of change across all elements of the enterprise organization. Today, in most companies, business processes are automated by applications that have been built in vertical silos, department by department, and LOB by LOB. Changing from these siloed business process and IT environments architected vertically to a horizontal architecture delivering services requires significant change (see Figure 13).



Identify similar resources and processes within each silo on the left.
Simplify, Standardize, Virtualize, Consolidate.
Design horizontal services on the right from standardized elements.
Modularize, Integrate.

Figure 13.

Clearly, business and technical architectures must change. Functionality must be organized horizontally so that it can be easily connected across internal silos and across the value network. In other words, vertical business processes and IT silos must be transformed into a horizontal enterprise architecture composed of modular components that can be quickly combined and recombined to offer new functions and services.

At the center of all of this change, we believe, is the relationship between business and IT. At its best, IT should be viewed as nothing less than the automation of business processes. But in many enterprises, IT is viewed as nothing but a cost center; boring and often annoying plumbing that is best kept out of sight and out of mind. Clearly, the IT function, in many companies has a long way to go. Let's examine explicitly the LOB-IT relationship.

LOB-IT Relationship

A fundamental property of services is that they are defined *top-down* but built *bottom-up*. Referring back to the Darwin Architecture model for a moment, we realize that business services would be defined in terms of customer and business needs, from the top down. As we saw with the earlier ATM example, however, services are built bottom up. That is, before a cellular debit card service could be offered, the lower level services must already be in place: balance validation, account look-up, etc.

This top-down, bottom-up dynamic often leads to gaps:

- Credibility gaps between what the business needs and what the business perceives IT can deliver
- Language gaps between the languages of business and technology
- Alignment gaps between what the business needs and what IT thinks its job is

We have already pointed out that formalized services can address the language and alignment gaps. This leaves, however, a credibility gap that must be understood and must be closed. Closing the credibility gap requires two things:

- Understanding the customers' (LOBs) perceptions
- Improving those perceptions by delivering an increasing amount of value to the business

To understand LOB perceptions of IT, we need a scale against which to identify what types of services are being delivered to whom within the Lines of Business.

This is one of the functions of the service maturity model. As the business value of the deliverables rises, business relationships are established and maintained higher and higher within the LOB and corporate executive management ranks.

Now that we have a scale, we need a model that can adequately characterize relationships between the LOBs and IT.

The Business Relationship Model

Remembering that the true job of IT is business process automation and the true goal of IT is to enable value creation for the business, it is imperative to be able to measure LOB trust and confidence in IT. However, trust and confidence are subjective, not objective measures and therefore are difficult to measure. Nevertheless, LOB trust and confidence in IT is essential to enable IT's capability to support strategic, critical business imperatives and produce maximum value for the business. In short, how IT is perceived determines whether IT is valued by the business or brushed aside and left to its own devices in the basement computer room.

IT organizations that wish to increase the trust and confidence of the business must first assess their position on a business relationship model and take specific action steps to improve the business perception. To assess their position, the IT organization must evaluate their processes and skills. The IT leadership must ensure that these processes and skills are supporting the needs of the business. In other words, business and IT strategies must be aligned.

An effective and efficient evaluation will clearly identify the focus of the IT function. Is IT operating as a business-oriented function or just as a technology-oriented function? Or is it something in between?

The IT organization has the opportunity to provide business services and add value through business and customer knowledge. But all too often, IT has failed to seize the opportunity and capitalize on its knowledge of the business. The result is the loss of the trust and confidence of the business units and the creation of IT silos based within the business units. Gaining the trust and confidence of the LOB customers requires IT to develop a relationship strategy.

In order to develop a relationship strategy, the first step is to understand the starting point. You have to start from where you are, not where you would like to be.

There are seven questions to be asked in order to determine the current degree of trust and confidence the LOBs have in IT. The questions, asked in this specific order, are:

1. Does the business believe that IT is a strategic asset and a major business resource?
2. Is service to end-users a top IT priority?

3. Are business users and LOB managers committed to and involved in IT projects?
4. Does the head of IT have a high status in the organization?
5. Is the IT strategy aligned with the business strategy?
6. Are existing IT systems strategic and integrated?
7. Does the business perceive the IT function to be business rather than technology oriented?

First, IT personnel answer these questions about themselves. If the answer is a strong and unequivocal *yes* to all of the above questions, there *may* be a good business-IT relationship and the IT environment *may* be functioning well and is under control. In short, if IT's perceptions are on target, then IT and the LOBs are *speaking the same language* and are working together well to create value for the enterprise. If one or more of the answers is *no*, then a less-than-desired relationship exists between IT and its customers.

The next step is to discover if IT's customers (LOB managers) would also answer a strong and unequivocal *yes* to the same questions. It is the customer perception of IT that is reality, not IT's own assessment. (Remember, the fourth characteristic of a service is that *customers are the judge of the value*; not the service providers.) Unless IT determines its customers' views, IT does not have the information needed to improve the value being delivered (or not) to the LOB customers. Failure to understand this is at the root of many IT problems.

As IT begins the journey toward a customer-oriented service organization, the changes required of IT skills could be enormous. Skills that need to be finely tuned might include:

- Business skills in order to be able to understand and anticipate the needs of the customer
- *Soft skills* such as personal communications, customer relationships, and account management
- strategic skills to look for added value vs. just looking for IT cost savings.

We use a business relationship model (BRM) to develop the relationship strategy and to identify the needed skills to enable a better alignment and relationship of IT with the businesses it serves. BRM confirms the type of relationship that exists between IT and its customers, as well as recommending how the relationship can be improved, thus bringing IT to the heart of the organization.

The BRM model suggests specific strategies and tactics for IT organizations to pursue. These strategies and tactics are aligned with the IT organization's position

on the model and help guide the IT organization toward specific actions to help transform the IT function into an asset that is perceived as strategic, is valuable to the future of the business, and is in a position of business leadership.

Traditionally, IT strategy has been devised in isolation and then imposed upon the business units. By defining the IT strategy in terms of formalized services being delivered at various levels within the enterprise to internal and external customers, it becomes hard to tell where the business strategy ends and the IT strategy begins. They meld into one unified customer-focused strategy. Improving the relationship between business and IT follows this sequence:

- Make commitments to service and support the customer
- Build up understanding of the customer
- Work together and develop mutual trust
- Build the strategy together

Our evidence suggests that you have to build the relationships before you can build the strategy together. The BRM model consists of 4 major *communities* or categories. Each of these communities characterizes the quality of the LOB-IT relationship at that level of relationship maturity. The four communities are:

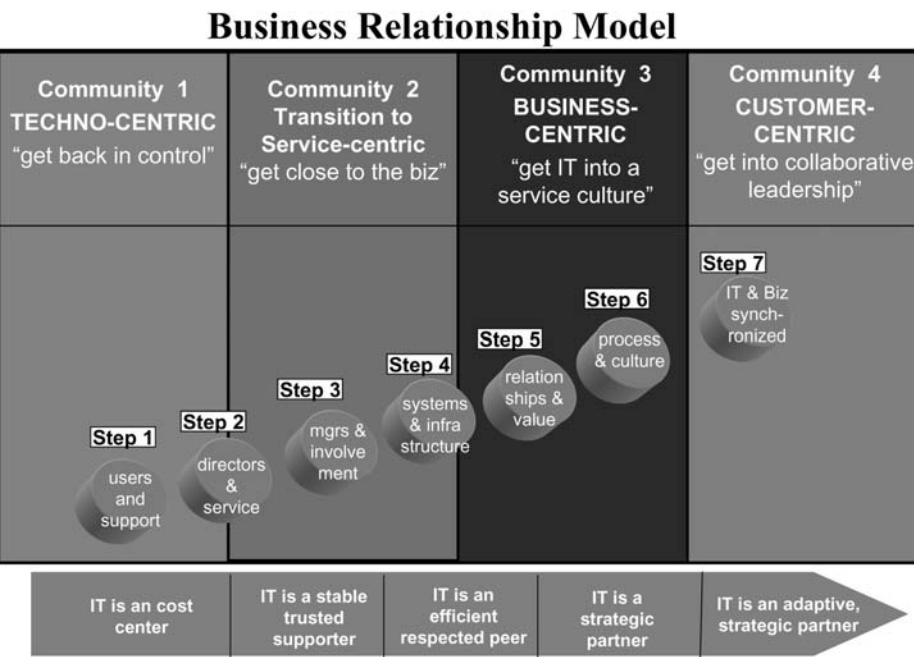


Figure 14.

- Techno-Centric
- Transition to Service-Centric
- Business-Centric
- Customer-Centric.

As the IT organization moves from one community to another, the maturity level changes from cost center, to stable trusted supporter, to respected peer, to strategic partner and to adaptive strategic partner. This progression is represented in Figure 14. High-level recommendations for action are made in seven steps. Each step identifies the target of the action and the focus of the action to be taken.

Techno-Centric

The IT strategy in the first community is to *get the IT environment back under control*. IT organizations in this community have a very technical orientation and are generally unaware of the business issues being faced by LOB and corporate executives. For this community, service is interpreted to mean *technical fix* and *every* problem is assumed to be solvable with technology.

For Techno-Centric IT organizations, there is only one real course of action: switch resources to end-user support in a major way. Clearly the alignment of the business to IT is important and needs to be addressed, but focusing resources on providing high quality support to the end-users is the fastest way to change customer perceptions about the IT department. Without this change of behaviors, a Techno-Centric IT organization will be relegated to the position of a sustained cost center and likely will be identified as a prime candidate for outsourcing. If outsourcing is not a strategic intention, Techno-Centric shops must gain control of the current situation and proceed to get much closer to the business.

Transition to Service Centric

The IT strategy in the second community is to *get close to the business*. The focus of the IT organization is on infrastructure rather than on individual technical *piece-parts*. For this community, the understanding of service is moving beyond just technical fix and is beginning to be understood as *quality of service*— uptime and response time.

An organization in transition has made significant progress in introducing customer service and business understanding into the IT function by focusing on improving the quality of service to the organization. Still, it will take time to change end user perceptions and progress will be patchy. The development of the necessary business, service and interpersonal skills will prove difficult.

The focus will change now from just doing the right thing to doing things in a much better way. Once the IT department is beginning to be seen as part of

the solution instead of the problem, it will be possible to start opening the kind of dialogue that is needed to create more ambitious initiatives in strategy and systems.

Business-Centric

The IT strategy for the third community is to *get into services*. A Business-Centric community has been migrating from a technical service function into a pro-active management function. For this community, the term service is understood as formalized deliverables for customers inside the enterprise and eventually for customers in the extended enterprise—partners and suppliers. The focus of the IT organization shifts from quality of service to customer satisfaction.

The change management skills that have been developed in refocusing the IT function are recognized throughout the organization. The IT function is playing an increasingly active role in implementing change across the business, as formalized services are beginning to be defined and delivered through the infrastructure and application services levels of the Darwin Architecture. The objective is to play a key role in driving this change, while keeping customer service at its highest levels.

IT should now start to leverage the experience gained from the earlier stages to get right into the core of the business. Given the pivotal importance of the entire supply chain in delivering the required quality of service to internal customers, leading edge procurement and supplier management skills need to be developed. Business-Centric communities will have to apply new technologies to reach beyond the internal systems into the entire value network.

These are major opportunities but IT must exhibit business knowledge and credibility before they can be perceived as leaders. Although a great deal of progress has been made, there are still a number of difficult cultural and operational changes that have to be made in order to create a world-class service organization. The focus now should be much more forward looking. Consideration should be given to such issues as account management within the business, the quality of the relationships, and whether or not the customer has an enjoyable experience.

The IT strategy should start to disappear as a separate entity; it is whatever is required to support the business strategy. Now is the time to ensure that IT is an integral part of the business strategy. IT must begin participating in business discussions with senior LOB and corporate business management.

Customer-Centric

The IT strategy for the fourth community is to *get into leadership*. The focus of the IT organization is now on working in full partnership with LOB and corporate executives to create new value and business opportunities for the enterprise. For this

community, service is now understood as a set of deliverables not only for internal customers but for external customers as well, across the entire value network.

The shift of most Western industrial economies from a manufacturing to a services base has made customer services the key differentiator for many, if not most, businesses. In this situation, experience and in-depth understanding of service concepts and the ability to deliver services across the entire value network is an extremely valuable set of skills and drives significant value creation for the enterprise.

Looking back towards Techno-Centric, the internal IT function has transformed itself from an inward looking techno-centric guardian of technology into a business-centric, world class provider of internal and external services.

FROM WHAT AND FOR WHOM...TO HOW

Let's review where we are. We began by examining five different perspectives on agility – the perspectives of the market, the business strategist, the vendor, the technologist, and the CFO. These five perspectives come together within each enterprise.

We have identified the importance of the customer in maintaining agility and that Agile Enterprises deliver value to their customers as formalized services.

We have shown how formalized services, delivered to both internal and external customers, serve as the language of an Agile Enterprise. The four lifecycle phases of a service (define, design, develop, deliver) provide a defined vocabulary and structure for alignment and continual synchronization between the business and IT.

Using the Darwin Architecture, we showed how services become the building blocks of an Agile Enterprise – examining how business services are composed of application services that are composed of infrastructure services.

We defined a service maturity model that identifies the nature of the services' deliverables as an enterprise matures its service delivery capability. We also focused on the customers of the services. Defining multiple services up the Darwin Architecture stack and across the value network means that in an Agile Enterprise there are many formalized customer to service-provider relationships.

We shared the Business Relationship Model that serves as a diagnostic tool to determine the quality of the relationship between customers and service-suppliers: between business and IT as well as between business and its external customers, suppliers, and partners.

Lastly, we described the four BRM *communities* (Techno-Centric, Transition to Service-Centric, Business-Centric, and Customer-Centric) and a seven-step

action plan that provide the basis for a go-forward action plan for IT to improve its relationships with its customers. This seven-step action plan strongly implies that transformation to an Agile Enterprise is not an event, but a journey. Multiple changes across people, process, and technology are required. These changes must be synchronized so that the business can meet its day-to-day obligations while at the same time transforming its business and IT processes, infrastructure, and organization to be able to flex and adapt quickly.

The final section of the chapter will identify the major areas of change that must be synchronized in order to transform into an Agile Enterprise as well as an approach for transforming *silos to services*.

MANAGEMENT OF CHANGE

Transforming from siloed business processes, applications, and infrastructure to an Agile Enterprise has been described as running a marathon while having a heart-lung transplant. Vertical process and infrastructure silos must be evolved to horizontal layers of services while keeping the business running and growing. Change is required in multiple disciplines across the enterprise. If the change is not managed, hardly anything would be as daunting except suffering the market consequences of not improving the enterprise's agility and effectiveness.

Let's re-examine the architectural transformation diagram in Figure 15 and major areas where change needs to occur:

LOB-IT Relationship

We have examined in some detail the requirement for relationships to change. As noted earlier, formalized services are defined top-down but are built bottom-up. This means simply that LOB trust and confidence in IT must be earned. IT must improve quality of service and formalize the delivery of infrastructure services to the business. Fortunately there are best practices standards, such as the IT Infrastructure Library (ITIL) that identify and document IT operational processes. Referring again to the Darwin Model, IT must build LOB trust and confidence at the lower levels of the Darwin stack by providing reliable and credible infrastructure and application services before IT will truly be a valued partner at the executive business table invited to discuss business needs and business services.

IT Operational Processes

An excellent representation and delineation of the ITIL processes can be found in HP's IT Service Management (ITSM) model. HP's ITSM model extends

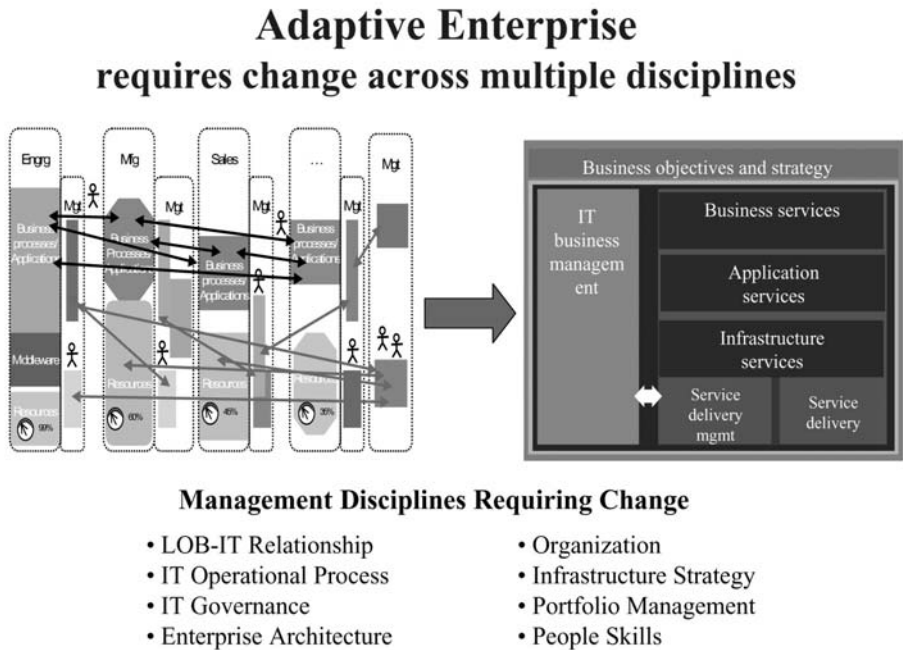


Figure 15.

the ITIL standards by specifying the seventeen processes (and the interactions between them) required to deliver value as a formalized service.

The HP ITSM model is divided into quadrants with each quadrant identifying the processes that need to be performed within the four lifecycle phases of a service. These four lifecycle phases can be seen on the outer ring of the diagram in Figure 16: define the business need (business to IT alignment), design the service and how to manage and measure the deliverables, develop and deploy the service, and operate the service.

These were suggested earlier, in the strategic business to IT alignment model, in Figure 6, as the basis for the common language between business and IT.

When building a *new* service from scratch, the processes are executed in *service creation order* indicated by the yellow numbers in the diagram. When seeking to transform to an Agile Enterprise, however, LOB credibility and confidence in IT are built by reliably executing the processes in *service transformation order* indicated by the numbers in dark circles in figure 16. This *service transformation order* logically maps to the guidance and prescriptions given in the BRM model we saw earlier and demonstrates the dependency between credible and reliable execution of IT operational processes and the level of trust and confidence LOBs have in IT.

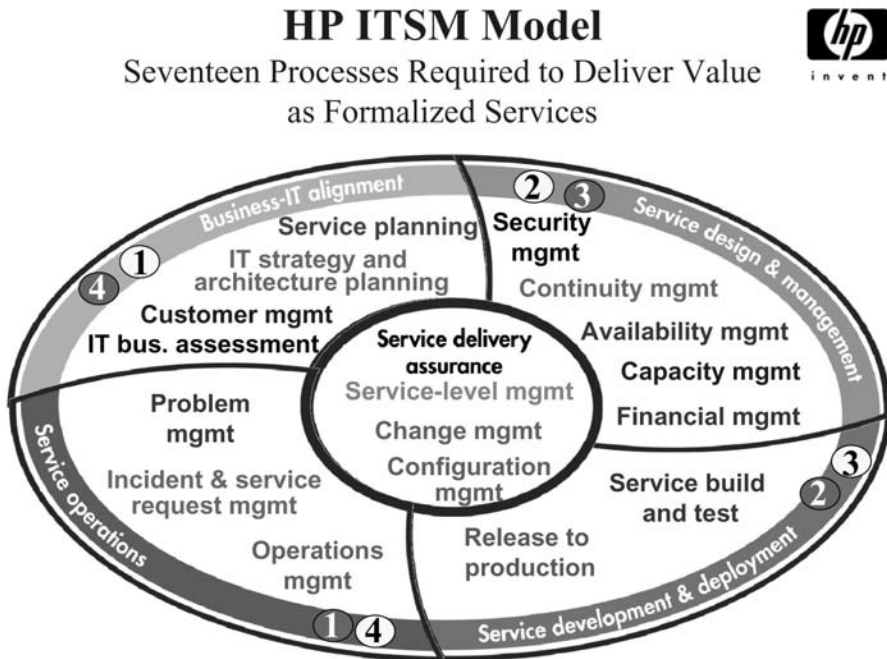


Figure 16.

IT Governance

IT Governance has to do with decision-making: who is authorized to make decisions; over what scope or domain; and how will the decisions be enforced. As enterprises transform from silos to services, which is towards an Agile Enterprise, governance shifts from a decentralized to a federated model. Decisions concerning business processes, applications, and infrastructure that once were the exclusive domain of individual departments or divisions now become part of a larger, enterprise, decision-making process. Processes must be extended and linked across silos, automated components re-used, standards leveraged, and architectures documented and simplified.

As was the case for relationship and IT operational process, governance for an Agile Enterprise matures through multiple phases—extending the domain of decision-making. These phases could be labeled: LOB, corporate, centralized, federated, and finally, business ecosystem. As the domain of IT governance extends from single silos across the enterprise, enterprise architecture—how all the pieces fit together—becomes of key importance.

Enterprise Architecture

Like the word *service*, the term *architecture* has many uses and contexts. Earlier, we described HP's Darwin Architecture as a way of describing the relationships between service elements. Technologists often speak of *vendor architectures* such as Windows or Unix. Other types of architectures include: application architecture, information architecture, infrastructure architecture, etc.

MIT's Center for Information Systems Research (CISR) has captured the meaning that is needed by an Agile Enterprise. CISR defines Enterprise Architecture as "the organizing logic for data, application and infrastructure captured in a set of policies and technical choices to achieve the desired technical and business standardization and integration." (Ross, 2004)

The following chart (Figure 17) illustrates the role of *enterprise architecture* as compared to other types (Laverdure, 2004). As seen in the Darwin model, enterprise architecture is about *connecting the dots*: i.e. linking the business view (business services) to the functional view (application services) to the technology view (infrastructure services) to an operational view (IT business management). Many companies have had a poor experience with enterprise architecture. Too many enterprise architecture efforts have ended up as thick binders collecting dust on someone's office shelf. We believe the right approach is to build an enterprise architecture one solution at a time. This requires an on-going discussion and alignment between the business and IT to document business objectives and guiding principles to guide decision-making. Hence, once again, we see the importance of relationship.

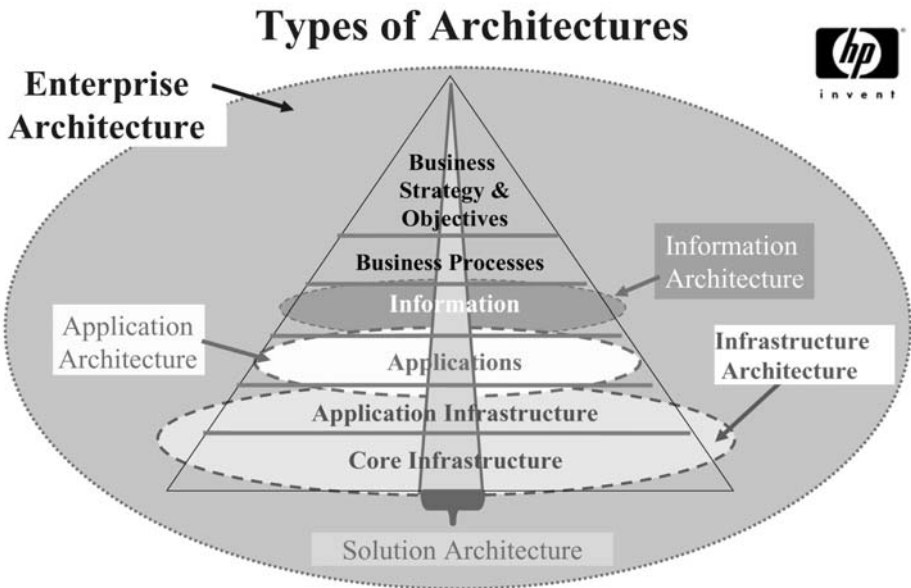
As enterprises progress toward agility, their implementation of enterprise architecture matures and addresses a wider and more comprehensive scope. This scope is reflected in how the physical computing infrastructure is deployed as well as the primary strategy of IT.

Infrastructure Strategy

Infrastructure strategy refers to how the physical computing infrastructure is built and deployed throughout the enterprise. Our research has shown that the computing infrastructure is just a physical manifestation of how siloed the organization and its processes are. Datacenter infrastructure is almost always deployed in a style (distributed, collocated, centralized, federated) reflective of the quality of the LOB-IT relationship, IT governance and IT operational process maturity.

Organization

Almost all large IT organizations have information officer or relationship manager positions. These personnel serve as the interface between the LOBs and the IT



Note: HP's Darwin Architecture describes the relationships between the elements.

Figure 17.

organization. One of their primary functions is to serve as a *translator* between the languages of business and IT. Additionally, they serve in an internal, unofficial marketing role – advertising IT's capabilities and successes to the LOBs.

The shift to formalized services changes both of these functions. In an Agile Enterprise, the services themselves become the common language. No translation is required. Additionally, because services, by definition, have measured and reported quality, many of the relationship and marketing tasks become automatic.

As organizations mature and become more agile, more roles change. IT roles change from managing hardware and problems to managing services. Service Manager roles are created at each of the Darwin service layers. In short, IT employees become much more intimate and engaged with the business issues.

Over time, we believe, the formal boundary between IT and business operations will erode. This is already happening in several leading companies.

In the mid-90's Owens Corning combined IT with logistics, supply-chain, material management, and a number of other functions into the *Systems Thinking Information Group*. (April, 2003) After its merger with Compaq, HP combined its global operations and IT departments into a new group known as GO+IT. (HP news release)

People

Not only will roles change, but the skills required by IT personnel will also need to change. Soft skills such as communication, listening, customer responsiveness as well as business management skills will become requirements even for technical staff. No longer will IT personnel be able to be oblivious to the business.

Process capabilities of the IT staff are also a key area of skill development. As an organization progresses toward agility, process maturity improves from ad-hoc to repeatable to best practices to quantitative management to continuous improvement. These improvements in process skills directly correlate to relationship maturity as seen in the BRM model as well as to IT operational process maturity seen in the IT Service Management model.

Portfolio Management

There are three possible methods for transforming to an Agile Enterprise: create new services, Big-Bang transformation, or evolutionary transformation. Each has its challenges.

Creating new business services from modular, lower-level application services and infrastructure services is difficult if the lower level functions have not yet been formalized as services. Often functionality at the lower levels is trapped or *land-locked* in one or multiple vertical silos.

Big-Bang transformation is the second method. Simply replacing all vertical business process—application—infrastructure silos with modular horizontal services is simply not practical or affordable for most enterprises.

The third method, evolutionary transformation, seeks to capitalize on the change events naturally occurring within the business processes, applications, and computing infrastructure of the enterprise. The goal is to orient the changes according to the models, principles, and design rules of an Agile Enterprise instead of just replacing elements within the same vertical silos and architecture. These natural events have multiple forms:

- New or improved customer deliverables requiring the implementation of new or modified business processes
- Up-revs of existing applications
- Lease renewal or upgrades of hardware

In order to use this third method, the organization must include the consideration of enterprise architecture within its portfolio management process. This represents an extension to the usual portfolio management practice of prioritizing projects on the basis of business value, resource requirements, and time. Now another

dimension is added for consideration: Agile Enterprise architectural requirements and opportunities for each project.

Gaining cooperation between business units and the enterprise can often be a challenge. It is easy to see the importance of Relationship and IT Governance in adding this architectural consideration to the portfolio management process.

The ability to catalog and manage the architectural implications and opportunities of multiple projects is, like the other disciplines, a capability that matures over time. Portfolio management maturity ranges from “no inventory of projects” to portfolio analysis being used to guide IT decisions, match business strategy, and align with the overall architectural vision. The visibility of projects, transparency of project information, executive dashboards, risk management, and project and program management expertise are all capabilities that must mature as an organization transforms from silos to services.

Adaptive Enterprise Maturity Model

Managing change across the above disciplines is essential when seeking to transform into an Agile Enterprise. We have analyzed the changes required across these disciplines and organized the changes into a unified maturity model called the *Adaptive Enterprise Maturity Model* (AEMM). This model, aligned and synchronized with the IT Service Maturity Model, discussed earlier, charts the maturity of each of the above disciplines across five maturity levels. The model exposes the logical linkages and dependencies between these disciplines.

Think of the AEMM model as a prism that separates white light into its constituent multi-colored wavelengths. As the enterprise takes on each new project or change, the success requirements for each of the eight management disciplines are identified and compared to the enterprise’s current maturity in that discipline. In this way, change can be understood and managed carefully and thoughtfully.

Understanding these linkages and dependencies, we believe, is a key enabler in understanding how to manage change, reduce risk, and minimize cost and time in seeking to become an Agile Enterprise. The AEMM model plays a pivotal role in our recommended approach to Agile Enterprise transformation.

ALIGNING THE TACTICAL FOR STRATEGIC INTENT

One of the great concerns that C-level executives have is protecting investments. The question always surfaces, “Do we have to rip and replace in order to build an Agile Enterprise?” We believe the answer is, “NO.”

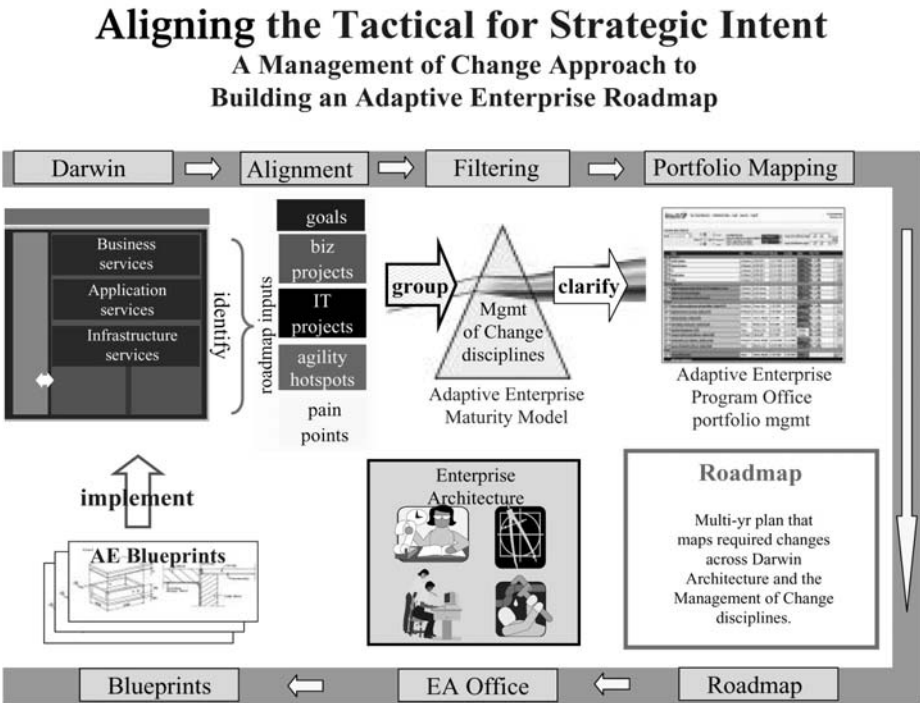


Figure 18.

Transformation to an Agile Enterprise is an evolutionary, not a rip-and-replace, process. It is a process, we believe, of aligning tactical improvements for strategic intent.

We want to take advantage of the normally occurring changes such as system upgrades, tech refreshes, application enhancements, and business process improvements—but organize these changes around a strategic Agile Enterprise goal and program plan.

Let’s take a look at the process of creating a customized Agile Enterprise roadmap. The seven-step process seen in Figure 18 follows:

1. Darwin Step:

The Darwin step is an education and alignment step. It is an opportunity to have a facilitated discussion between LOB and IT concerning LOB perceptions of IT and LOB needs, challenges, and business metrics. These discussions help us determine the overall agility maturity of the client.

The Darwin step also provides an opportunity to introduce to both IT and the LOB the concepts concerning the vertical to horizontal

transformation and the architecture of agility. This is the purpose of the Darwin Architecture. It is important to develop a common vision concerning the characteristics of the desired end-state.

2. Alignment Step:

Next we take a look at the five main inputs to the process, making an inventory of: the business goals, the current and in-plan business application, and IT infrastructure projects. We also identify the agility hot spots and LOB pain points. The agility hot spots are those business processes that are not well synchronized with IT. Taken together, these inputs paint a good picture of current issues and plans, competitive position, as well as critical success factors.

3. Filtering:

We then send all this information through a filtering mechanism that we have developed, called the Adaptive Enterprise Maturity Model. The AEMM model separates out the changes that each project, initiative, goal, hot-spot, etc will require in each of the management of change disciplines in order for each project and initiative to be successful and each goal to be met – while at the same time identifying what must be done to help the client progress toward their Agile Enterprise goal.

4. Portfolio Mapping:

We then map all the various projects and initiatives to their dependencies in each of the disciplines and technical architectural areas so that we can clearly identify patterns, commonalities, and dependencies.

The mappings then become input to a portfolio management process within an Adaptive Enterprise Program Office that allows our clients to best leverage investments across multiple projects and initiatives. Because we are leveraging the work across the management of change disciplines, clients are able to make progress faster, at lower cost, with a much greater return on IT investment.

5. Roadmap:

The output of the portfolio management process is a customized Adaptive Enterprise Roadmap. This Roadmap is meant to be a living document that is updated quarter by quarter as projects are completed and new projects are added.

6. Enterprise Architecture Office:

Next, the Roadmap becomes input into an Enterprise Architecture Program so that detailed architectural blueprints are developed for each individual project and initiative based on the architectural standards in place and under development by the customer at each level of the Darwin Architecture.

7. Blueprints:

Finally, the project blueprints are taken to implementation under the management and guidance of the Adaptive Enterprise Program Office. Changes and improvements are made and the cycle repeats itself, then, on a regular basis.

SUMMARY

Agile Enterprises deliver their value to internal and external customers as formalized services. Formalized services, by their very nature, can serve as the common language between an enterprise and its customers and between the LOBs and IT. By utilizing a horizontal architectural model such as Darwin, formalized services can serve as the building blocks of an Agile Enterprise. A service maturity model that identifies what services are delivered to internal and external customers can serve as the framework for judging progress along the Agile Enterprise journey. This service maturity model can be extended across multiple management of change disciplines to guide progress, reduce risk, and maximize return on investments. The tactical changes, experienced by every enterprise on a regular basis, can be leveraged towards the strategic intent of transforming into an Agile Enterprise.

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4

THE ON DEMAND WORLD



Mapping the Government Genome

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When the U.S. Human Genome Project completed its mission in 2003 by identifying all of the approximate 30,000 genes in human DNA, they say we entered the ‘biology century.’ Yet Harvard’s President, Lawrence Summers, complains repeatedly that many of its own students graduate without knowing “the difference between a gene and a chromosome.” For most of the rest of us, the television show *CSI Miami* is about as close as we get to understanding DNA.

Your body is made up of about 10 trillion cells. You have 46 chromosomes. Chromosomes are made of DNA. Each chromosome has many genes. Altogether, human DNA has about 30,000 genes. A genome is all of the DNA in an organism, including its genes. Genes carry information for making all of the proteins required by all organisms. These proteins determine, among other things, how the organism looks, how well its body metabolizes food or fights infection, and sometimes, even how it behaves. DNA has four different chemical building blocks. These are called bases. In the human genome, about three billion bases are arranged along the chromosomes in a particular order for each unique individual. The order of these bases underlies all of life’s diversity, dictating whether an organism is human or another species such as yeast, rice, or fruit fly, all of which

have their own genomes. Virtually every cell in your body carries all of your DNA. To get an idea of the size of the human genome present in *each* of our cells, it would take the equivalent of 200 volumes—the size of a Manhattan telephone book at 1000 pages each to hold it all.

Now you know more than the average Harvard graduate.

Because all organisms are related through similarities in DNA sequences, insights gained from nonhuman genomes often lead to new knowledge in human genomes (About the Human Genome Project, 2004) and vice versa. In much the same way, all governments are related through similarities in their ‘DNA sequences’ representing, if you will, the government species. Think of each agency as a chromosome. The typical government has about 70 ‘chromosomes.’ Each of these agencies or ‘chromosomes’ has multiple genes with basic chemical building blocks of people, processes, and technologies organized in a particular order that uniquely determines how they are organized and how well they operate. Altogether, all of the DNA, including the genes, makes up the government genome. Given the commonalities of the government “species” wouldn’t it be nice to map the government genome to uncover what makes one subspecies thrive and another end up on the endangered list? Some promising new thinking is moving in that direction.

THE GOVERNMENT GENOME

Since the 1980s business process reengineering has generally focused on one process at a time within one internal organizational unit. Much has changed since then and this simplistic method is no longer adequate. Many private sector companies have already squeezed out almost all of the cost and time they’re going to find using business process reengineering. IBM’s CEO Sam Palmisano describes the new era we are entering as “*the on demand world*.” He said, “Enterprises best equipped to compete in that world are “*on demand enterprises*” whose business processes—integrated end-to-end across the enterprise and with key partners, suppliers, and customers—can respond with flexibility and speed to any customer demand, opportunity, or external threat.” What makes the on demand world different is the fact that there’s not only the opportunity to get better but also an opportunity to create a major step-function improvement—to breakthrough barriers once thought insurmountable.

Given this new environment, the traditional process view is far too linear and macro. Today, the highest government transformation priorities are typically horizontal, cross-boundary, cross-government, cross-jurisdictional, and public/

private integration. These cross-boundary processes straddle organizations within the government enterprise and extend beyond the enterprise to other governments or to the private sector. The cross-boundary trend mandates a more sophisticated understanding and manipulation of the fundamental building blocks of a government—their underlying DNA.

Just as your own genes dictate whether you are tall or short, whether you have thick hair or are bald, or whether you have a propensity to disease, so does the genetic code for each government. Governments need to start perceiving themselves in terms of their genetic makeup—groups of people, processes, and technologies—and the specific traits of individual government units instead of a collection of autonomous agencies. Scientists now routinely transfer DNA from one organism to another creating recombinant DNA. That's what needs to be done in order to achieve capabilities to facilitate cross-boundary integration. For example, once you identify genetic markers of success—such as an innovative culture or use of open source technologies—and transfer them to other units, you begin to create government organizations resistant to the diseases of inertia, ineffectiveness, and poor performance.

A genetic or modular view of government is different from a process view. A process is basically a set of sequential business activities (step 1, step 2 ... step n) that create some business value. Process reengineering analyzes a specific process in terms of where steps might be improved, automated, or eliminated to reduce cost, time, or to improve performance. A more modular or genetic view is essential to becoming on demand—where components can be swapped in and out, switched around, and recombined at will.

A group of resources (people, technology, and processes) itself can be viewed as one 'step' in a cross-boundary process. A simple example is the "process payment." Generally that's one to several steps in a process redesign project. Instead, think of "process payment" as a group of competencies made up of people and technologies that process a payment. Suddenly you have a competency that can be "reused" many times as parts of other completely unrelated multiple processes that also involve payments—so long as the technologies are compatible. That's an on demand enterprise that allows resources to be organized differently to eliminate duplication or ensure they are aligned in the most effective way. The result is flexibility and optimization regardless of the source of the resource.

By viewing the enterprise as a collection of components, or genes, you can identify and prioritize transformation initiatives, determine where to invest more resources, or where you can free up resources by opting for an outsourced solution that is integrated both in the process and with technologies. When an enterprise is broken down into components (typically 50–60) the result can be enlightening. You may find 5–10 duplications of the same component! By viewing each

component as a standalone service, you begin to see new possibilities—outsource it, use it as a web service, make it a utility, and develop it as a shared service across the enterprise.

ON DEMAND INFORMATION TECHNOLOGY INFRASTRUCTURES

Growing up, one of my children's favorite toys was Legos. They come packaged in a box with a picture of a ship, bridge or some other structure on the front. However, it didn't take them long to discover that because the pieces were interchangeable, they could build anything they imagined—not just what was on the box. Our biggest problem is that we don't have the luxury of knowing what will happen in the future or how we will need to use resources at a moment's notice. The trigger might be new legislation or a terrorist event. We don't know whether we'll need to build a bridge or a ship or something else between or among different entities. If one entity has Legos and the other has wooden blocks, it ain't gonna happen, at least anytime fast.

For this new business model to work requires a modular IT infrastructure. Many elements of cross-boundary processes are still enmeshed in organizational silos with their own IT applications and infrastructures. These IT infrastructures were built to support the automation of individual standalone processes within an organizational unit—not across organizational units. To create an integrated horizontal or cross-government process, you need to think about your IT agenda in new ways. This requires a highly modular environment where application and infrastructure can be easily defined and manipulated.

The use of open standards makes it possible to integrate processes that weren't originally designed to work together. Open standards mean that systems (networking, programming, data storage, communications) conform to a recognized set of industry standards rather than single-vendor proprietary 'standards.' By governments adopting open standards themselves and mandating that any of their partners or suppliers also conform to these industry standards, governments maximize the ability to connect any-to-any, as needed, on demand. With open standards, you don't have to re-create applications every time some piece of hardware or software changes. Advances in IT now support a modular IT infrastructure built to correspond with new modular business designs. New IT capabilities include tools to integrate existing assets and open standards that support loosely coupled services across boundaries and allow integration with outsourced components. The overall IT simplification results in a consolidated,

logical view of resources. This integration includes legacy systems within government and eventually extends to systems deployed by customers, partners, and suppliers who are part of the overall value chain. As an example, an integrated infrastructure allows multiple organizations responding to an emergency to collaborate and share critical information in real time to more effectively deal with the crisis.

The government genome is an excellent structure to understand information flows among components. The enterprise architecture defines the standards governing how information is managed and exchanged. The IT capability includes computing platforms, operating systems, software, data, and networks required to support the components in the overall business model. The enterprise architecture provides the framework for selecting specific products and building a capability that can adapt to changing requirements over time. IT is the lifeline to enable integrated business activities to work by seamlessly connecting government departments, partners, and suppliers.

In the future, governments will want to take advantage of the capabilities of virtualized services that are becoming available. With workstation utilization often less than 20 percent and server utilization only moderately higher, enterprises have a considerable amount of available computing power to use to meet peak workload requirements. The virtualization of resources in an on demand operating environment enables governments to reduce overall capacity requirements and share available computing capability across the enterprise and eventually across other enterprises.

Much like the new dynamic stability capability of some SUVs that can apply brakes to each wheel independently in the event of an impending roll-over, the right IT foundation can be autonomic—i.e. able to self-configure, self-monitor, self-diagnose, and self-heal problems without human intervention. As networks become more complex, a single failure can often cascade into a complete meltdown of the computing infrastructure. Autonomic capabilities dramatically improve resilience of the infrastructure and reduce disruptions to the operating environment.

The cumulative result of these technology infrastructure changes is a real opportunity to leapfrog incremental change—to integrate disparate, standalone *operations internally and externally*—and optimize them as an integrated whole so they work better together and deliver additional value.

Case Study: On Demand Arizona

Arizona is a great example of a state that has moved into the on demand world. The Arizona Motor Vehicle Division (MVD) has worked with IBM

for almost a decade to deliver more efficient, convenient services through electronic transactions. In 1997, Arizona's citizens began to see the benefits of this partnership with basic online capabilities, kiosks in select MVD offices, and interactive voice response (IVR) for basic transactions such as vehicle registration renewal. ServiceArizona won numerous awards and became an early model for other governments to approach online service delivery.

However, in 2003, new legislation required the issuance of temporary tags to be reflected immediately in the state's backend systems. This meant tighter interactions with external businesses that facilitate routine citizen transactions on behalf of the division. Under particular scrutiny was the issuance of temporary license tags to citizens by car dealerships. However, a lack of integration between dealerships and the state meant that the processing of temporary tags was delayed, which spelled potential trouble for Arizona law enforcement.

Not only did MVD face this compliance issue, it also wanted to ensure that it was delivering convenient, responsive services to citizens, fleet operators, loan providers, car dealerships, and others. To do so, the division needed a flexible, standardized method of handling transactions with third parties, one that would simplify ongoing integration efforts and keep capital investments to a minimum. In 2003, MVD worked with IBM to simplify its back end business processes and create a flexible integration platform that makes it easier for third parties to communicate with the state. MVD has used the platform to create real-time data flow with car dealerships, complying with new regulations and eliminating the lag time before the state is able to identify the owner of temporary tags. Other capabilities include license renewals at dealerships, motor carrier permits, and permanent fleet renewal. The solution has even been used to integrate other government departments, as exemplified by online voter registration capabilities (the first such service in the U.S. and at no cost to the user). The government-to-business project is part of a larger ongoing effort to use technology to deliver more responsive services to citizens. It is the latest addition to Arizona's Web portal infrastructure, ServiceArizona.

Process redesign led to a number of improvements; for example, the redesign led to a reduction in the need for paper signatures and the associated overhead costs. Digitized citizen signatures and photos are now part of the service, and this has enabled broader applicability to applications such as online voter registration. Utilizing a portal approach gives the state a system-wide standard user interface with the capability for other state functions to join in.

The actual development and operation of the IT infrastructure is entirely virtualized. MVD is not charged for the development of the applications nor is it charged for the acquisition or operation of the infrastructure. Instead, charges are transaction based. The consumer or business user pays

the same amount that would be paid in-person, IVR, or U.S. Postal Service services, and the state determines who should pay for each transaction (the user or the division) and establishes the optimal transaction fee.

Consumers and businesses can now utilize services on a 24/7 basis without the state needing to commit upfront funding for infrastructure, application development, or operation of any application. For the user, there is now an alternative to standing in line during business hours or using the U.S. Postal Service. This service is also available through the Arizona State Portal Web site, which has an easily navigated user interface (developed with representation from Arizona Commerce, Tourism, the Governor's office, State Library, and an outside ad agency) that presents a standard look and feel to Arizona's citizens and businesses.

UNDERSTANDING WHERE WE'VE BEEN AND WHERE WE'RE GOING

On demand is already everywhere, but many people do not recognize it yet. Consider the capability of "On Star"⁷ to call your vehicle and dispatch police if the system detects an air bag deployment. That's end-to-end integration among different entities, leveraging and exploiting today's technologies. Government services are almost always delivered using a combination of government labor plus materials or other services purchased from external suppliers. An agile government uses these external suppliers as seamlessly as its own resources to deliver better service, respond quickly to changing environments, and significantly increase productivity and effectiveness.

Fortunately, a convergence of forces is enabling the 'perfect storm' in which new business models and new technologies intersect to unleash new cross-boundary capabilities. One of those business models takes a component view of the organization, or its DNA makeup.

Governments with foresight are leading the way and embracing the concept of an on demand government. Those who successfully integrate within the enterprise and across external boundaries will be able to respond with the kind of speed necessary to dynamically meet unending and growing demands upon government. The good news is that an on demand strategy builds upon all the hard work that has gone into e-government over the past decade. In fact, the past thirty years' of management theory in practice—Management by Objectives, Total Quality Management, Process Reengineering, and Change Management—all contribute to this springboard to the future. Good principles of creating a

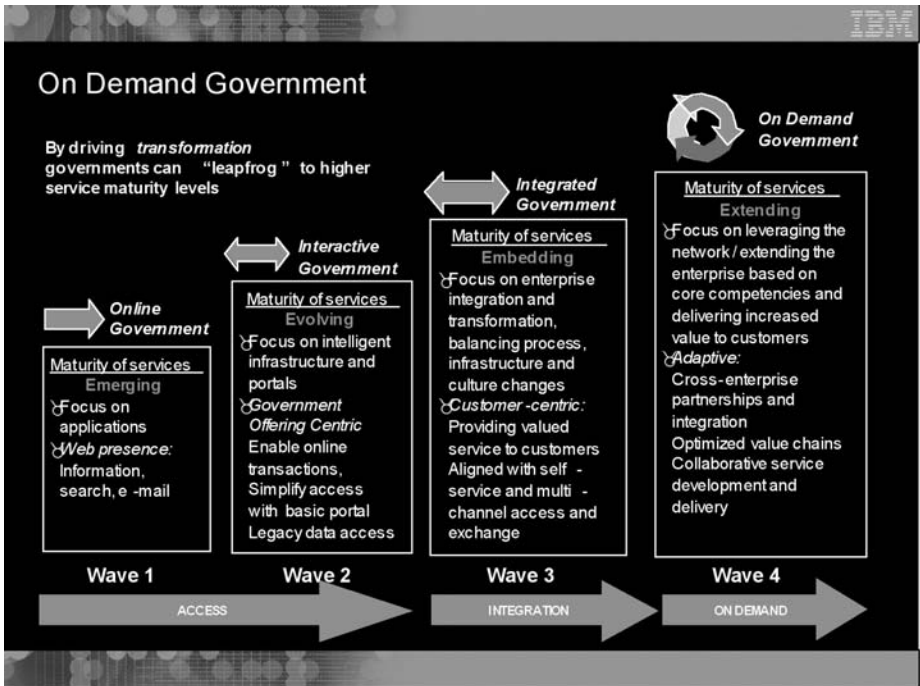


Figure 1.

compelling vision, creating an environment for culture change, and documenting the business case continue to assume important transformation roles. The journey toward on demand government is visualized in Figure 1 as four waves.

Wave One: Online Government

Governments creating their presence on the Web characterized the **first wave**. It's hard to imagine a government now without a Web site that offers a wealth of information to citizens and businesses. Information on these early Web sites generally mirrored the way government was organized. Pretty soon, however, agency Web sites proliferated out of control into a jumble of confusion for the average citizen not familiar with the intricacies of how the government was organized. The Internet changed, technology changed, administrations changed, and citizen expectations changed. It became unacceptable to take a citizen through information about how to process a government transaction only to be told at the end to print and mail a form or visit a government office to complete the transaction.

Wave Two: Interactive Government

Fairly quickly it became obvious that the government's electronic 'face' needed to be organized from the users' perspectives and needed to be interactive to the

conclusion of a transaction. In the **second wave**, portals were readily adopted from a functional point of view (“how do I...?”) versus an organizational view. And, the first electronic transactions were launched where citizens or businesses could finish a task online instead of just researching information.

Wave Three: Integrated Government

A new level of sophistication emerged where the commonalities and complexities of operations within government were recognized. Internal integration is the hallmark of the **third wave**. Integration generally occurred in clusters of departments (such as social services agencies or tax administration) with common needs or the same customer set. In response, cross-agency processes were redesigned in social services or tax administration supported by technology. Or, projects may include integration of internal support functions such as finance, human resources, procurement, or information technology that touch all departments. Governments here begin to break out of the confines of “one agency, one process” into integration at an enterprise level.

Wave Four: On Demand Government and Six Steps to Get There

The on demand government enterprise of the **fourth wave** is unlike the first three waves in significant ways. Here the focus shifts from internal to external. An on demand government is one whose business processes are integrated end-to-end not only across the enterprise but also outside the enterprise with key partners, suppliers, and customers. That only happens with open standards. The result is capability for unprecedented flexible and fast response to changing customer demands, opportunities, or threats. It presents not just the opportunity to get better but also the opportunity for major step-function improvement.

Getting to the fourth wave addresses the pressing issues of today, but also enables governments to address major long term goals like economic growth, controlling healthcare costs, meeting the needs of disadvantaged and aging populations, and increasing the skills and education level of all citizens. Government plays a major role as a catalyst in all of these areas.

- Step One: Create the Vision. “*Where there is no vision, the people perish*”—*Proverbs 29:18*. Vision acts as a guiding light to capture the hearts and mindshare of the people within and outside an organization whose support is needed to accomplish change. A compelling vision should focus on value created for the most important customer. The customer set will vary from individual citizens, business constituents, other governments, employees, partners, or even suppliers. With

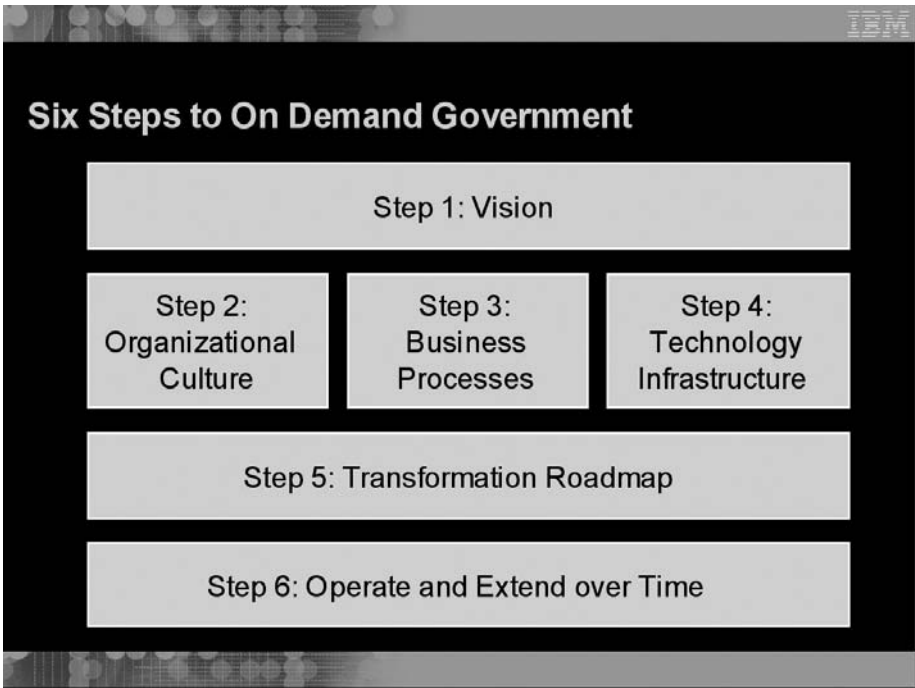


Figure 2.

customers at the core, attention will shift away from an internal view of the government. This encourages imagination in finding innovative ways of doing business rather than limiting focus to current challenges and incremental approaches. Government visions need to embrace the power of end-to-end integration of an extended enterprise from external entities such as citizens and business constituents, through the heart of internal operations, and extend all the way out to external suppliers. This re-conceptualization is the admission ticket to an on demand world.

- **Step Two: Reshape Organizational Culture.** The declaration of a new vision means change is coming. Change means people must leave their comfort zones; displacement leads to uncertainty; uncertainty leads to speculation; speculation leads to fear; and, fear leads to resistance. To avoid this downward spiral, the role of executive leadership takes on even more importance to continually communicate and reinforce the vision. Web portals are effective communication tools. Recognize and celebrate successes people and projects. Help people to transform themselves through training & new skill development. Cultural issues within transformation projects need to be identified and understood in

a collaborative environment. Particularly crucial is effective governance where representatives from all stakeholder groups (including external groups) actively participate and continually solicit feedback from their constituencies. Culture change occurs when people see that new roles will be more fulfilling and understand how they can develop the skills to deliver increased value.

- **Step Three: Document the Business Model.** Early process reengineering focused on improving existing processes. On demand transformations encompass the creation of new processes that span multiple business activities and cross boundaries. Take a broad view of the customer and use customers as allies in the change effort. Explore the possibility of duplicative processes and combine them for efficiencies. Fully investigate the processes that link partners and focus on common customer objectives. Assess and prioritize the most critical projects—those core to the delivery of the new value proposition. Establish a manageable scope. Choose projects wisely considering strategic implications, financial impact, and the value toward achieving the vision to create the business case. Frequently, good candidate projects are those that facilitate shared services across an organization, such as IT, finance, or procurement. Choose those with relatively low upfront investment and organization risk and yet have the potential to yield tangible results. Make sure you choose a balanced mix of process, technology and culture change projects (see Step Five).
- **Step Four: Design the Technology Infrastructure.** Build an effective enterprise architecture to ensure that IT capabilities (information, application, technology, and security architectures) will be seamless for processes that cross boundaries. Facilitate collaboration and data sharing where appropriate. The ability to capture, analyse, and share information across the enterprise allows the organization to proactively identify ever-changing risks, requirements and opportunities, and the framework to respond with unprecedented speed and efficiency. New technologies and operational models have emerged that, for the first time in decades, create opportunity to deliver radical change and improvement across the IT infrastructure. Combined with open standards, these technologies offer powerful transformative capabilities. Utility-based computing, grid computing, and mobile, wireless technologies are just a few. Ultimately, open infrastructures should be extended to suppliers and customers. IT optimization will almost always cut costs and enable governments to take advantage of emerging technologies that enable customers to share

unused capacity and implement self-healing capabilities to further reduce support costs and reduce outages. Across public sector organizations, there is a wealth of resources and know-how that is either duplicated or lost within departmental silos. The key is to manage resources holistically and transparently, either internally or externally, through outsourcing and shared service relationships. Look for ways to fund, starting with returns inherent in IT optimization.

- **Step Five: Build a Transformation Roadmap.** A transformation roadmap is the collection of individual projects (process, technology, culture) selected to achieve the vision. Many governments, consultants, and technology companies alike make the mistake of focusing on a process redesign, an IT redesign, or a culture redesign independently of each other. IBM's approach integrates process, technology, and culture change projects because tight coordination among them is essential. Any change to process will affect the culture. Any change to technology will affect process and culture and so on. It is helpful to actualize the roadmap as a document in order to chart the steps of each project. (See Figure 3 below.) The individual projects move the organization in a stair-step progression, balancing attention, funding, and execution among process, culture, and technology. Each project may have its own steering committee, but it acts in concert with the overall transformation governing body. Central funding of projects increases organizational willingness to collaborate on new projects. Retain part of the savings from completed projects to encourage and reinvest in new projects.
- **Step Six: Operate and Adapt Over Time.** Implement performance metrics that define desired outcomes and measure progress against expected results. Periodic publication of results communicates progress and reinforces commitment. Measurements determine whether initiatives are working, call attention to adjustments that may be needed, demonstrate results, and justify future investments. The probability exists that critical customer needs or some part of the environment will change significantly before the transformation is complete. So, allow a process for the model to adapt over time. Stay abreast of the rapid pace of technological change. Something that you might not have been able to tackle at the beginning may suddenly become possible. Or, technology may change so dramatically that other management alternatives are indicated—consolidation or commercial management. Continue good governance and change management practices.

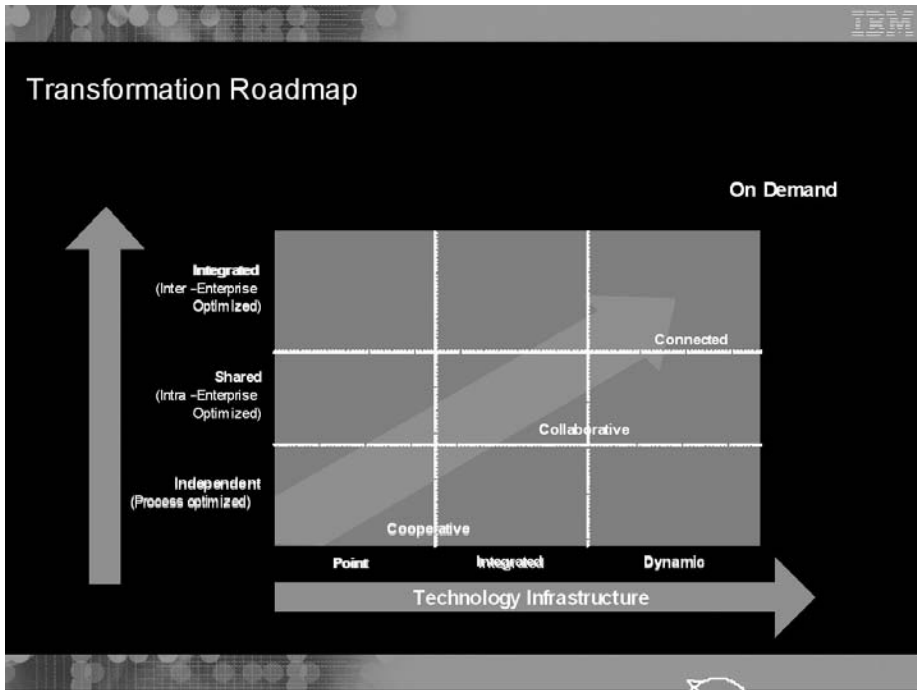


Figure 3.

Begun formally in 1990, the U.S. Human Genome Project was originally a fifteen-year effort coordinated by the U.S. Department of Energy and the National Institutes of Health. However, rapid technological advances accelerated the completion date by two years and concluded early in 2003. Aside from identifying all 30,000 genes in human DNA, another important feature of the project was the federal government's long-standing dedication to the transfer of technology to the private sector. By licensing technologies to private companies and awarding grants for innovative research, the project catalyzed the multibillion-dollar U.S. biotechnology industry that continues to foster the development of new medical applications. Research and development is just one illustration of the many roles of government. An on demand government is one that can fundamentally improve its performance in any of its many roles. We are in the midst of an industry-changing phenomenon. Not every government will take the same path to get there. Regardless of how you start, the important thing is to start.

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5

INNOVATION MANAGEMENT IN AN AGILE ENTERPRISE



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INTRODUCTION

This chapter looks at the key role innovation must play within an enterprise faced with uncertainty in a rapidly changing global environment. To set the scene, we briefly discuss the macro-economic trends that make innovation mandatory, not a luxury. These trends lead to fundamental changes in the nature of innovation from a purely product or service focus to continuous and holistic creativity in all aspects of business. To succeed, the enterprise becomes an “innovation engine”. This demands new management skills—skills that most of you will not have learned as, even now, they are just appearing in education curricula. You will gain insight into these “new” innovation forms through some short cases that will illustrate the seven major new attributes that successful “innovation engines” exhibit. We also discuss how, as managers, you can lead your corporate culture to support continuous and agile innovation. Finally, you will learn how innovations in innovation management itself can be used to mine the know-how, experience, and creative capacity of your organization in real time while underpinning a supportive culture.

BACKGROUND

Throughout history there have been periods of dramatic societal changes driven by major technological innovations. You certainly learned at school of the agricultural revolution with the introduction of farm-tools and crop management techniques that fundamentally changed the economics, social structure, and wealth creation of whole *regions*. A few hundred years later, innovations in machines, transportation, and metallurgy created the industrial revolution with enormous impact on whole *nations'* workers, which again triggered a tremendous creation of wealth. Then came the computer; however, this time the potential impact was different for several reasons. The underpinning technology of computers, as succinctly captured by Moore's Law, advanced so rapidly that individuals, companies, governments, and nations have been unable to adapt to the changes thrust upon them by each new generation of computing power. Therefore, to understand the information technology revolution, it is appropriate to break down the changes of the last thirty years or so into subtly discrete disruptions.

When the computer first entered the business world in the form of mainframes with programs and data stored on cards, enterprises implemented applications that directly substituted for repetitive human tasks such as payroll management, billing, etc. The computer was principally a productivity tool. Even when the desk-top and later, lap-top models appeared, they were used primarily for speeding up existing tasks such as sales forecasting, document and presentation preparation, etc.

It wasn't until the last decade, when computers (and other digital devices) became connected or networked and automated search techniques were developed, that a cataclysmic shift occurred, from an emphasis on productivity to that of global knowledge sharing. We are only just beginning to understand the implications and effects of this connectivity. Let's put some numbers around it. Although it is notoriously difficult to accurately size the Internet, any estimate provides staggering statistics. According to research from Nielsen//NetRatings in February 2003, conservatively, over 580 million people worldwide had Internet access. Extrapolating data from NUA, at the time of this writing, we can expect this number to have grown to over 700 million. At the same time the information available to these Internet users is exploding with over seven million new Web pages being added daily to the several billion that already exist, many pages linking to other archived data sources (Cyveillance, 2000). Other estimates quote fifty million independent Web sites existing at the end of 2003 (Zakon, 2004), growing at a compound rate of 200% per year (OCLC, 2003). Google claims to regularly scan 6 billion Web pages; this may only be 1% of the total of so-called "hidden pages" that exist.

As you will see from the next section, this dramatic expansion of knowledge access is accompanied by a collapse of barriers that “conveniently” protected companies from fierce competition in the past while providing newly agile corporations access to capital, labor, skills, know-how, fixed assets, and intellectual property almost anywhere. In a world where there are no hiding places, and everyone has access to the same resources on equal terms, innovation is the only way that profitable, high margin growth can be sustained—not innovation in products, but innovation in all aspects of a business, holistically, continuously, and flexibly practiced across departmental, national, and corporate borders. So fundamental are these changes, we boldly decry a new era, “The Innovation Era”. The following diagram shows the waves of disruptions impacting businesses as information technologies remove knowledge barriers.

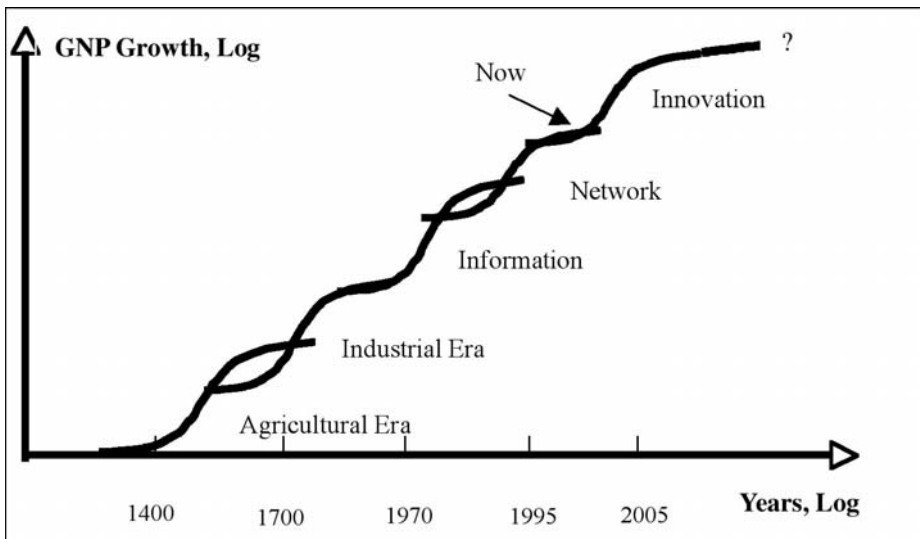


Figure 1. Accelerating Waves of Technology Driven Social Disruptions.

THE COLLAPSE OF PROTECTIVE BARRIERS

Access to Knowledge.

As you saw in the introduction, we are rapidly moving to a world in which essentially all knowledge can be accessed by everyone at minimal cost. (NUA, 2004) Importantly, knowledge is no longer confined to local communities

and networks. It is just as easy to find an expert at a University in Melbourne, Australia as Melbourne, Florida; or a corporate partner in Cambridge, Mass as Cambridge, UK. To remain competitive today, it is no longer sufficient to rely on local know-how; indeed it is vital to access the best ideas, technologies, research resources, experts, wherever they are. The value of geographical centered clusters, propounded for example by Michael Porter (1998) as an important vehicle for future economic success, is being devalued by local know-how enclaves becoming less relevant as the internet spreads its tentacles. Dependence on local knowledge and support is no longer sufficient, indeed may even be dangerous by creating an inward looking false sense of security. Unfortunately, too many economic development programs both at regional and national levels are managed through political jurisdictions and therefore are sub-optimally a zero-sum exercise. Often they just move jobs and wealth from one area to another. In contrast, the new, networked world can support a biotech company headquartered in Seattle, with basic research undertaken at Universities in San Diego, Edinburgh, and Auckland, scale-up of production in Singapore, and clinical trials in the newest members of the European Union. Its advisory board will be undoubtedly international in make-up. A management challenge—yes, but by assembling appropriate resources to compete quickly and efficiently, a more certain success. These knowledge-centered structures are variously referred to as “virtual knowledge networks” or “virtual clusters”. They are fluid and may form and dissolve in short shrift when no longer valuable, whereas geographical based clusters may take years to evolve, with the danger of then being outmoded and redundant.

Trade-barriers

Concurrently historical trade barriers for goods and services are rapidly being dismantled opening up all markets to global suppliers. Figure 2 was compiled from WTO data shows the rapid acceleration of trade agreement implementation. Barriers to competition from import/export controls that companies could hide behind in the past are dissolving. There may be occasional short-term restrictions applied for political reasons, but the overall trend is clear.

Access to Capital

Simultaneously with the elimination of trade barriers for goods and services, restrictions on currency trading have also been almost entirely removed. Now daily cross-border trading in currency dwarfs the value of imports and exports.

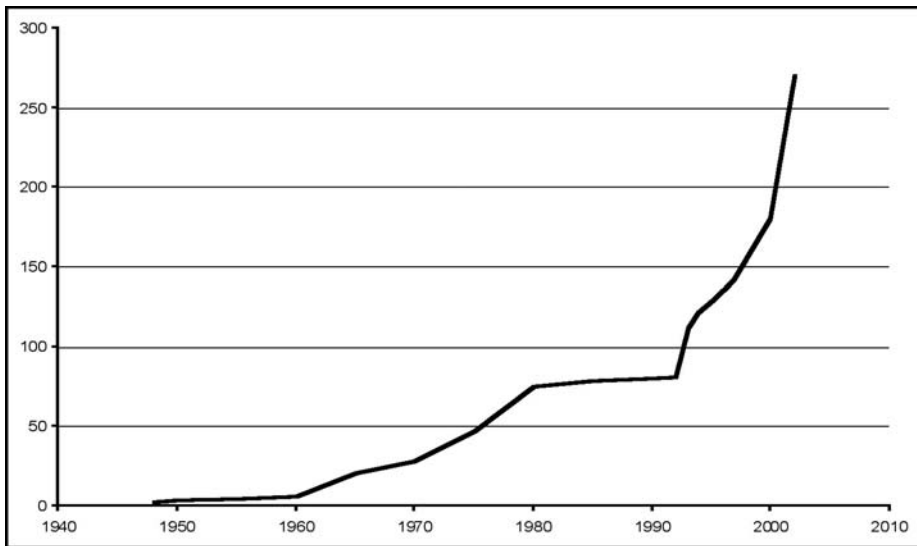


Figure 2. Growth in Number of Trade Agreements. (Source, WTO)

Although most currency trading is on a short term basis, the lack of restrictions in the majority of economies to inward or outward foreign investment means that funds may now seek opportunities on a global basis and firms must compete internationally for both debt and equity finance. Fully 20% in mutual funds managed in the US, and a mainstay of US personally managed pensions are now invested overseas. The Wall Street Journal predicted that 2004 would be a record year for US investors to place their investment bets overseas, with \$90BN slated to flow into foreign corporations (Karmin, 2004). Figure three shows the growth in value of international holdings in securities. Geographical location no longer provides any significant advantage for access to major sources of capital. Of course, there are still local economic development grants but as they have proliferated, they are no longer a real differentiating factor.

Venture Capital remains one source of funding that prefers proximity; but overall, VC funds are a very small part of total growth capital. Even venture capital is trending international. As reported recently (Fannin, 2003 and Deutschman, 2004), leading “Sandhill Road” VC firms are looking to target a significant part of new funds for investment in early stage companies in Asia, hoping to bring their start-up management skills into markets where US style venture capital is little known. Clearly they are not finding sufficiently attractive opportunities nearby.

As an indicator of how internationalism has flourished in liquid asset deployment, Figure 3 shows the growth in the daily *ratio* of international currency flows as a multiple of international trade. Today, more than one hundred times as

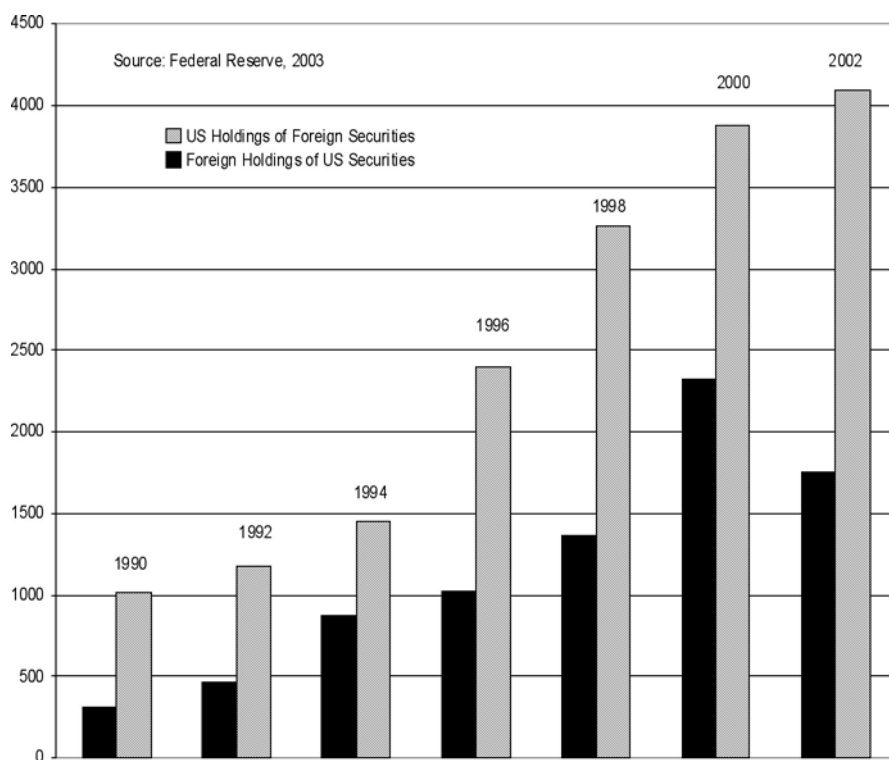


Figure 3. International Securities Ownership: 1990-2002

much currency flows across borders every day than the value of goods and services (Siegel, 1998).

Technological Obsolescence

We often hear that product lifecycles are declining; however, it is notoriously difficult to find hard data supporting this fact. Clearly, it is much more likely to be true in fast moving consumer products such as food and detergents, and in products in which the underpinning technology is driven by Moore's law, or is impacted by major technological shifts. According to an internal study in the mid-nineties by Hewlett-Packard (Hohmann, 1995), the average period that their products remained major contributors to sales has fallen from four years in 1980 to well below two years in 1995. More recent studies (IBM, internal study, 2003 and Industry Week, January 2004) measure product development times. These have reduced from an average of 225 days, three years ago to 207 days now. In the portable communicator business sector populated by such companies as

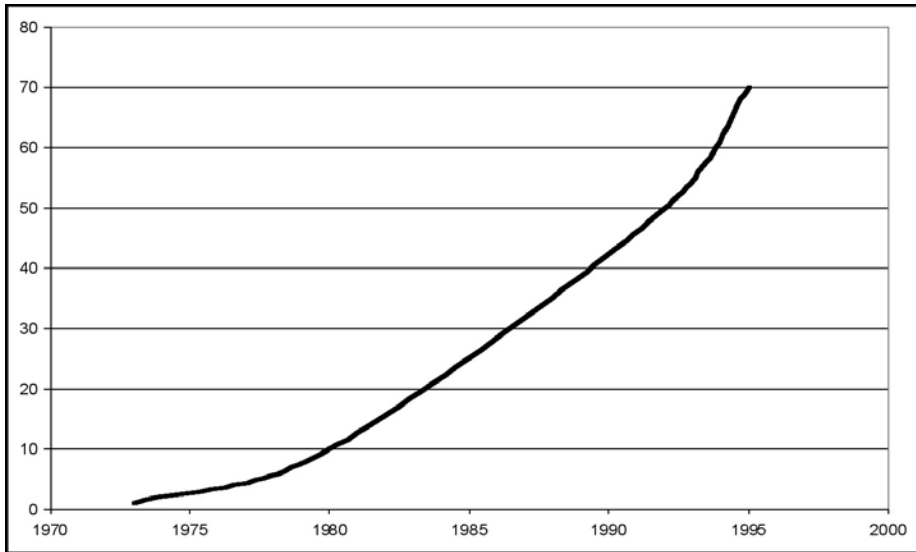


Figure 4. International Currencies Flows as a Multiple of Trade

Motorola, Nokia, Blackberry, etc. market life cycles are now less than product development cycles, challenging even the most efficient engineering departments. To meet these challenges companies are developing new methods to reduce their product development times by employing 24/7 activities spread around the world. The Munich based lead team hands over to Peking at the end of the day, whose team, in turn at sunset, hands over to Denver. In many cases these teams may not be on the staff of the lead company, but may be joint development partners that are assembled quickly to meet an urgent deadline. Managing such complex projects across corporate, national and cultural boundaries requires new skills that ensure that “getting it right first time” can be achieved. There is no room for error. An indicator of this phenomenon is the emergence of the dozens of software providers that provide the support systems for both rapid product development and product life-cycle optimization.

Of course, in slower moving sectors such as machine tools and locomotives, the evidence for rapidly declining product life-cycles is not so obvious. However, even here, the impact of low-cost electronic computing power and the ubiquity of the internet are accelerating the upgrades that customers expect to provide them more than just a product; they anticipate nothing less than a total solution to their requirements throughout their ownership. These additional service components may cover not only financing and operator training, but remote condition monitoring for 24/7 online support and maintenance, performance guarantees with financial penalties, and even taking back the product for recycling at the end

of its life-cycle. Each of these service components demands implementation of new technologies within even the most traditional of engineering sectors.

The acceleration of product lifecycles changes the way that you must manage intellectual property. In the past, the 17–20 years of protection afforded by a patent was often valuable over its full life. But when technology evolves rapidly, twenty years of protection loses its value. Research by the authors (Susman, Warren, and Turrell, 2004) shows that companies are re-evaluating the ways that they protect their intellectual property and are carefully selecting which areas to seek long term patent coverage, usually on fundamental inventions, and foregoing patents for trade secrets elsewhere. Patent law requires inventors to “teach” what they have done, and this inevitably exposes concepts and know-how that may be better kept secret rather than giving competitors a jump-start to catch up. An agile company has moved on by the time patents are issued and the patents may be of more value to competitors than to the owner. In the new innovation model, churning out patents is replaced by including the protection of intellectual property within the overall business strategy rather than a way of protecting an invention. And when patents are filed, they are written to protect both the “hard” invention and the unique business model surrounding it.

In some sectors, of course, patents will continue to be the principal method to retain protection from competition. For example, the long and expensive development cycles and regulatory hurdles governing pharmaceutical products encourage the use of patent protection. Even here, however, careful selection of what to patent and when in order to retain maximum advantage after perhaps a 10-year development cycle is a challenging task.

Summary

So we must now envision a world in which access to knowledge and expertise, labor and capital is truly global and transparently accessible and where technology relentlessly advances. Breakthroughs are no longer confined to just a few centers of excellence such as Bell Labs or MIT; the next breakthrough can just as easily occur in Bangalore, Beijing, or Brisbane as in Boston, Bristol, or Basel. Shorter product life cycles and rapid technological obsolescence makes patents lose their power in monopoly preservation. In addition, managers can no longer rely on the traditional protections of trade and monetary restrictions, local labor pre-eminence, and cosy knowledge clusters to provide competitive advantages. The only way that sustainable advantages can be earned is through continuous innovation—not only innovation in product development, but in all aspects of enterprise activity—and at an ever-increasing rate.

Of course, there has always been innovation in corporations. Indeed, Baumol (2002) argues that the unprecedented wealth generated in the major economies in the twentieth century would not have been possible without innovation. However, until relatively recently, many firms could survive and prosper without innovating—they competed in a protected environment. Now, *innovation is no longer a luxury, it is a necessity.*

NEW MODELS OF INNOVATION

It is not surprising therefore that our traditional management structures and methods are sorely stretched to perform in this turmoil. This section is intended to provide managers with insight and methods for improving their innovation agility. We discuss in more detail what we mean by continuous and holistic innovation, with examples. The work in this section is largely based on recent studies undertaken with one of our colleagues, Gerald Susman (2004).

Before discussing the new models of innovation, we need a definition to focus our thinking. Often, innovation is still interpreted as “new product development,” and we first need to disavow this view!

Definition of Innovation

There are many definitions of innovation in the academic and business press. For the purpose of this chapter we choose the following:

“Successful innovation is the use of new technological knowledge, and/or new market knowledge, employed within a business model that can deliver a new product or service to customers who will purchase at a price that will provide profits.”

This definition is built on the generally accepted work of Afuah (1998). In order to focus the discussion and to emphasize the new innovation, we have added the following:

“**Successful...**” in order to emphasize that we are not interested in innovation that fails to deliver and maintain value for the innovating enterprise.

“**...employed within a business model...**” in order to stress that innovation in a business model is as important, perhaps more so, than purely product or process

technology. This new emphasis on business models is emerging as a key point in our research as well as the research of others. It arises from major changes in the business environment such as shortened product life cycles, information intensity and transfer, and globalization of markets and resources. These factors challenge the ability of an innovator to retain the value derived from their innovations. It requires an enterprise to become an integrated innovation engine.

“...that will purchase at a price that will provide profits” in order to stress that success requires the innovator to be able to extract benefit from the value that they create. Afuah’s definition includes innovations that customers may want but will not pay enough for, or innovations where the value created by the innovator migrates to another enterprise that may even be offshore and therefore does not necessarily increase the economic wealth of the innovating enterprise. In fact, we suggest you use gross margins in your business as the key metric for determining whether your organization is continuing to innovate effectively. If customers won’t allow you to retain a high gross margin, your products or services are being commoditized, and *ipso facto*, you are not innovating sufficiently.

Holistic Innovation Attributes

As the traditional barriers to competition arising from patents, trade restrictions, and preferred access to capital and labor skills disappear, corporations must seek other ways to sustain leadership positions. Recent research within the Smeal College at Pennsylvania State University (Susman, et. al 2004,) partially funded by the US Department of Commerce, identified common attributes shown by companies that continue, year after year, to create highly profitable growth. Although not every company researched showed each attribute, certainly not to the same level, the data provided a highly consistent picture of what innovation means in our rapidly changing world. We break down these attributes into seven key areas shown in this diagram immersed in a “Supportive Corporate Culture.”

We will discuss each briefly and provide illustrations. Of course, every company must find its own unique solution, but you will see patterns that will help you explore new areas of innovation in your own organizations. Most importantly, these new innovators view creativity as a daily, enterprise-wide behavior, led from the top. It is not housed in R&D, or marketing, or seen as something that you do when challenged. It is a holistic process that permeates the whole organization, day-in and day-out to create a smooth, running “innovation engine”. This does not mean that chaos reigns! The rules are clear; everyone knows what to do and what the targets are – the results show.

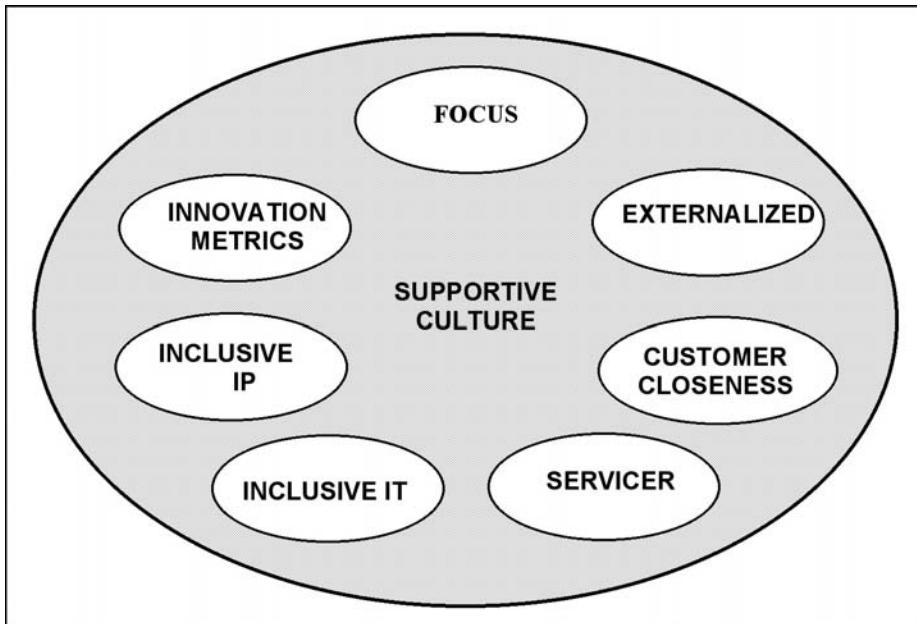


Figure 5. The Seven Holistic Attributes Shown by an Agile Innovator

Externalized

Agile innovators are continually scouring the world for new ideas, technologies, partners, etc. They understand that they cannot do everything for themselves, they embrace outside ideas, and they excel in partnership relationships. They encourage everyone in the enterprise to be inquisitive. *If you have installed software to monitor your staff's "wasteful internet surfing", disable it!*

Mini-case: PBR is a public, Australian company with \$650MM revenue in 2003 mainly in brake calipers for the automotive sector, the majority sold to US OEM's. It is a world leader in aluminum casting. PBR actively seeks complementary partners for accelerating product development. To this end it has developed methods to rapidly assemble partners, cooperate effectively, and share benefits. PBR's Joint Development Agreements (JDA's) are clear and simple to understand. They do not attempt to define final outcomes initially but allow gracious migration towards supply agreements, or even fully operational jointly owned companies. The difficult issue of IP ownership is dealt with up-front. Any IP that is generated in the partnership is jointly owned and cannot be withdrawn by any partner, even if they do not

continued

Mini-case: PBR continued

proceed to a contractual status beyond development. PBR understands that setting up these partnerships is key to future success by reducing product development times, retaining focus on core competencies, and making efficient use of resources. In addition, PBR has technical specialists that spend one day a week looking at external technologies and developments. PBR works with Universities as sources of new technology and benchmarks its own manufacturing processes against the best searching for best practices and excellence.

Customer Closeness

Agile enterprises work closely with their customers realizing that the next product or service idea may come from them. But more importantly, they create symbiotic linkages with their customers that provide value to both parties and subtly establish barriers to followship from competitors.

Mini-case: General Fasteners manufactures bolts and other metal fasteners for the automotive industry in which there is an oversupply. General Fasteners uses an innovative business model to de-commoditize their business. They undertake the engineering design for new car platforms, taking responsibility for how the car will be reliably assembled. This requires special, hard-to-come-by skills. They then contract to supply the OEM with just-in-time components directly to the production lines, with 100% quality inspection and guarantees. They purchase fasteners either internally or from other suppliers and manage an integrated supply chain from design to final assembly. This requires GF's computer architecture to seamlessly integrate with OEM plants exchanging data in real-time. They are "locked-in" to their customers both in design and operations making it difficult for competitors to displace them. They provide both products and services.

Servicer

As we saw, General Fasteners provide both products and services. They solve problems for their customer and hence create greater value for both parties. Agile innovators blur the barrier between product and service; they see themselves as solution providers and partners with their customers. Dell's customers get a product configured and manufactured just for them—it can be different from any other computer that Dell has ever made. They permit a customer to "self-

serve and self-design” online providing a totally customized product coupled with minimal selling costs. This “instant just-for-me” online experience is migrating from consumer to business markets and must be taken into account as new business models are explored. Agile manufacturing enterprises are reconfiguring their businesses to provide total service solutions from first contact to delivery of product and supporting services.

Mini-case: Greif Packaging, a supplier of metal drums for shipping bulk chemicals, many of which are toxic, realized that they had no real competitive position and margins were thin. Listening carefully to their customers, they saw there were unmet needs and new sources of value to be accessed. They converted their business model to being a “trip leasing” company for specialty chemicals—the FedEx® of problem chemicals. Now they solve the total trip problem for their customers—drum supply, cleaning, refurbishing, regulatory compliance, transportation, and tracking. They built a new web application. Although they sub-contract out most support functions, they capture the value in the supply chain and build long-lasting client relationships. Moreover, they buy support services in volume, and their database of trip costing enables the company to accurately quote on “trips” and to provide customized and traceable service. This shift has significantly improved their margins and cash flow, which they can direct to further innovations.

Inclusive IT

Traditionally, a firm’s IT function remains outside the “innovation loop.” It operates as a service to support business models that are designed without including input from IT managers. Holistic innovators include IT as a core component of their innovation process, on a continual basis. IT is used to provide greater value to customers, tighter “lock-in” to both vendors and customers, and *most important*, to accumulate intellectual assets in the form of minable data that, over time, is prohibitively expensive for a competitor to acquire and apply. This data accumulation is much more than that found in “customer-relationship management” systems which have migrated towards efficiency tools rather than strategic weapons.

Mini-case: DBI based in Pennsylvania provides “vegetation management” for businesses including Class I railroads which are regulated by the Federal Government on the amount of vegetation that may grow on rights of way.

continued

Mini-case: DBI continued

DBI has a dominant position in this sector by first designing and building their own vegetation treatment road/rail vehicles. These can rapidly mount the track and detect the location and type of vegetation along the line, mix optimized herbicides in real-time, and spot-spray using robot arms. The amount of chemical used is minimized. By mapping the exact location of every plant using GPS technology, the company ensures that its next service run can be accomplished in minimum time with highly efficient utilization of chemicals and equipment. The proprietary data that the company collects on its clients' unique situations are a major competitive advantage making it exceedingly difficult for a competitor to bid accurately on a contract and to compete in service. DBI has no patents but protects its know-how and data through trade secrets and works with universities to augment its science and technology.

Inclusive IP

The protection of an enterprise's intellectual property is often considered as establishing and supporting a patent portfolio where inventions are handed over to patent attorneys once the decision to seek protection has been made. Patents are written to protect the technical invention rather than the business model in which the technology is embedded. Agile innovators have a clear understanding of how IP is incorporated within the company. Are there projects where information should be on a "need to know" basis? Does everyone understand how trade secrets are protected? Are processes patented? How is IP shared with partners? Asking these questions within companies like W.L. Gore, the materials specialist, and Lutron, the lighting control company – both companies known for their continual ability to innovate and whose success is built entirely on this – garners consistent answers from everyone. Is this true in your company? If not, you do not have an inclusive IP strategy.

Innovation Metrics

How do you know whether your company is continuously innovating without systems in place to measure it? 3M, long recognized as having the ability to continually develop and launch new products, counts how much revenue is derived from products that were not in the market two years previously. There is a danger, of course, in counting products that are not truly innovative, perhaps having a slight modification only, at the request of a customer. A better solution is to actually measure the gross margin that products generate.

Mini Case: Restek develops, sells, and supports worldwide highly specialized components for gas chromatography. The company embeds within its management information systems specific metrics for innovation monitoring. Total gross profit over the lifetime of a product divided by the R&D investment that went into the product is targeted to be *five*. This target helps the company evaluate the pay-back period of their investments. In addition, they measure the gross margins on each product. Products are only deemed to be “new” if the gross margin exceeds by eight percent or more the mean for all products. This avoids any complacency that might arise by confusing new SKU’s, which often occur, from true new products based on innovation. The company has a specific target for these new, innovative products both in number and revenues. Restek has a record of profitable growth year-on-year from its stream of new products. It has a system for seeking new technologies worldwide and often partners with Universities.

Use and dissemination of such innovation metric systems throughout an enterprise communicate the importance of continuous creativity to everyone in the organization and thereby underpins a supportive culture.

Focus

Rapidly changing technology, markets, and competition demand that any enterprise must excel in what it chooses to do, and this implies that it does not undertake activities better done by a partner or a competitor. Agile corporations focus; they do not waste resources on diversification into businesses where they have little to offer.

Mini Case: Taprogge is the worldwide market leader in designing, building and commissioning cooling water systems for power stations, seawater desalination plants, refrigeration, and industrial plants. It has over 90% of the world market. It is a technically rich company with several hundred patents and significant trade-secrets in the manufacture and selection of the disposable sponge balls that are used to clean water systems. Many installations are connected directly to the Internet so that performance anywhere in the world can be monitored at the corporate headquarters in Germany, and preventive maintenance instructions provided to customers before any critical problems arise. This provides a highly valuable service while reducing the need for expensive field experts. The company’s Web

continued

Mini-case: Taprogge continued

site (www.taprogge.de/en/) immediately conveys a knowledge of industrial water systems that is daunting to would-be competitors while providing confidence to customers. Taprogge has a passion for what it does, a drive to dominate its chosen niche, and an unwavering focus. This focus commands an unassailable position against competitors. Although much of its R&D is done in-house, from time to time, Taprogge accesses new technologies from partners and Universities.

Summary

In talking with all the companies mentioned in this section, we came away feeling that they had something special. Innovation was something that they do all of the time, everyday. It is not a part of their life; in many ways it is their life. We call this “holistic innovation.” It demands a unique corporate culture to be successful. Very few companies exhibit an all-embracing yet controlled innovation-supporting culture. We therefore now turn to this thorny subject to provide you with some guidelines on how you can begin to reinforce your enterprise culture to promote continual agile innovation.

CORPORATE CULTURE

In our most recent research interviews and from reviewing past work in the field we recognize that successful, creative companies have developed and nurtured a culture that explicitly and, more importantly, *implicitly* supports “holistic” innovation. Companies with seemingly identical financial assets, products, brand recognition, etc. may perform entirely differently. One is highly successful while the other gradually declines. The former is judged as innovative, the other dull or unable to get its innovative ideas executed smoothly. Why is this?

There has been much research in this area, and many business books written about the field. On one point at least, there seems to be consensus. Innovation requires leadership support from the very top of the enterprise. Unfortunately, innovation management is not addressed in most of our business schools and therefore, unless a manager has a natural acuity for leading an innovation driven organization, the organization will usually flounder.

One aim of our work has been to develop a set of readily understandable and actionable attributes that occur in nearly every successful innovative company. Managers can adapt their management styles, communication skills, incentive structures, etc. to

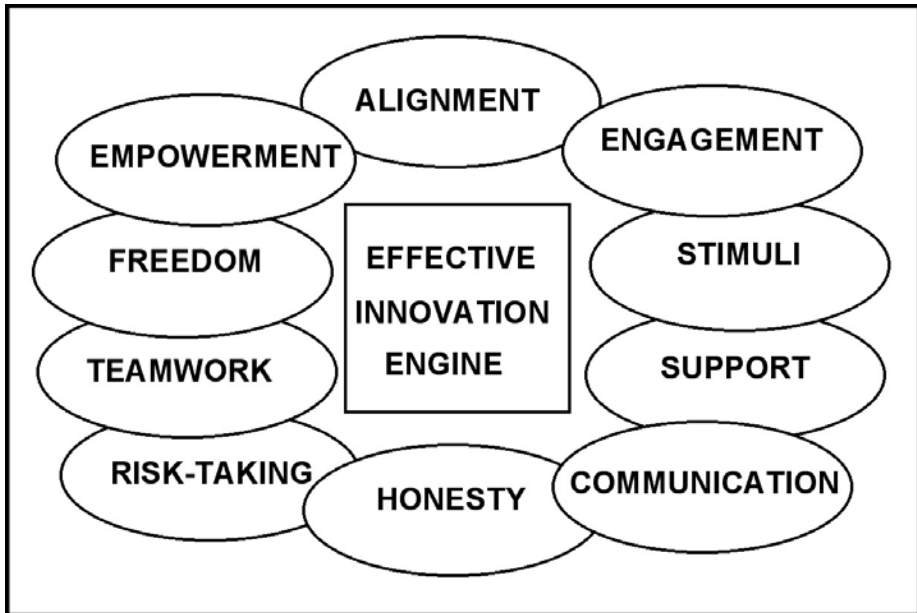


Figure 6. The Ten Factors for an Innovation-Supportive Culture.

strengthen the culture for creativity. We have narrowed these attributes down to ten factors. Ideally, these factors are mutually orthogonal: i.e., each does not depend on any other. This is difficult to achieve, but by attempting this construct, it is easier for managers to identify areas where improvement might be required, without too much concern that changes in one area will create other problems.

The following table provides definitions together with illustrative statements that might be casually overheard within an enterprise. We suggest that you review these factors and ask yourself whether your organization exhibits these attributes. What would you hear if you could be a fly on the wall in your offices and production facilities? If you cannot imagine hearing these statements, start modifying your behavior and communications to move the organization towards a culture where such factors would become more evident.

Table 1. Cultural Attributes of Successful Innovative Enterprises.

Attribute	Definition	Example Statements
Honesty	The degree to which each employee has total confidence in the integrity, ability, and good character of other employees and the organization, regardless of their role.	"I trust the people I work with. I find it easy to be open and honest with people from other departments."

Attribute	Definition	Example Statements
Alignment	The degree to which the interests and actions of each employee support the clearly stated and communicated key goals of the organization.	"We have clear aims and objectives which everyone understands. We build consensus around key objectives. We recognize and reward loyalty."
Risk	The degree to which the organization, employees, and managers take risk.	"I am encouraged to experiment; we take calculated risks. We encourage trial and error."
Teams	The degree to which team performance is emphasized over individual performance.	"We promote teamwork. It is the center of everything that we do. There are usually people from other departments in my team. We have both problem-solvers and 'out-of-the-box' thinkers in our teams."
Empowerment	The degree to which each employee feels empowered by managers and the organization	"As a manager, I am expected to delegate. We have a 'no-blame' culture. We allow staff to make decisions."
Freedom	The degree to which self-initiated and unofficial activities are tolerated and approved throughout the organization.	"I am allowed to do my own thing. We encourage people to take initiatives. We recognize the individual."
Support	The degree to which new ideas are encouraged from all sources and responded to promptly and appropriately.	"We encourage fresh ideas and new approaches. We reward innovative individuals. We reward innovative teams."
Engagement	The degree to which all levels of the organization are engaged with the customer and the operations of the organization.	"Management understands the operations of the company. I can share problems with my managers. I know why my job is important."
Stimuli	The degree to which it is understood that unrelated knowledge can impact product, service, and operations improvements.	"I am encouraged to search externally for information. I obtain data from many different sources. We listen to suggestions from suppliers. We use consultants in focused rolls."
Communication	The degree to which there is both planned and random interaction between functions and divisions at all levels of the organization.	"I am kept in the picture on how we are performing. We have excellent formal channels of communications. We use best practice knowledge transfer between departments. We actively manage our intellectual assets."

INNOVATION MANAGEMENT

The Innovation Pipeline

As we have seen, an agile enterprise must foster a supportive culture for innovation and invest in appropriate support processes and technologies. Innovative concepts can come from anywhere in the organization, and frequently from customers, suppliers and other third party individuals or organizations. Leading firms adopt *holistic* corporate-wide methods to harness these diverse inputs across the *Innovation Pipeline*. The Pipeline supports all related innovation activities, not just product development. The Innovation Pipeline works equally well for new technology implementation, HR initiatives, improvements to manufacturing processes, or the generation of new business models.

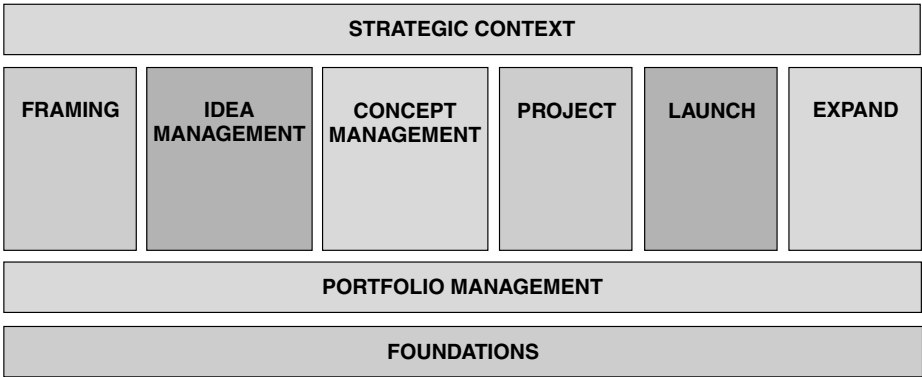


Figure 7. The Innovation Pipeline

Strategic Context encompasses the business goals; the current and future state of the firm; management commitment and desire to grow, the market dynamics; the competitive, regulatory, and economic environments. The context is determined by the overall corporate strategy, or the strategy at business unit level. Strategy drives the criteria for making decisions and the decision making process itself. Strategic Context creates the boundaries of the innovation process, particularly in terms of needs and goals.

Framing establishes the areas of strategic focus for innovation, and the framing of specific corporate challenges that need to be addressed to achieve corporate goals. Examples include the identification of new market opportunities or technology platforms.

The Idea Management process defines the generation, collection, development, evaluation, and selection of business ideas. Typical methods include brainstorming, creativity techniques, focus groups, and online idea capture and management systems. The Idea Management process can take place through the work of individuals or through groups working together. The process may be highly formalized or ad hoc and unstructured.

From this stage, ideas are developed into concepts, and the top concepts are moved into the **Concept Management** phase, covering the development and analysis of concepts and business opportunities. Concepts are considered as *pre-projects*, where a decision has not yet been taken to proceed with a project and allocate substantial resources. At this stage there are often competing concepts or projects that could fulfill the same business objectives. The output of Concept Management is a relatively small selection of concepts that have become approved projects through business case approval, and a larger number of concepts that have been held back, de-prioritized, or shelved. Projects that receive authorization and the necessary commitment of resources move into **Project Management** phase in which enterprises apply the traditional skills of project and resource management.

Ultimately the top projects reach the **Launch** phase, whereby the projects are released to the market or, in the case of internal process improvements, deployed to staff. This phase relies on established techniques to execute launch plans, drawing on operational experience and resources.

In some cases, the company can derive maximum value from an innovation by applying deliberate methods to **Expand** the offering. In this phase the company takes the knowledge and improvements gained from the initial launch and incorporates them into new product lines or internal processes. This may involve developing new markets, adapting market messages, modifying pricing, channels of distribution, or the formulation of the core product. Successful execution of this phase creates enduring product lines or process improvements that maintain and increase the profitability of the activity.

The Pipeline operates in a context of **Innovation Foundations** that underpins all innovation activities including organizational, cultural, and process-based attributes that contribute to short term and long-term success. Some are focused on specific areas of the business, whereas others are functions or activities that are common to many business activities. Foundations include executive support, quality leadership of innovation activities, the existence of processes and systems, and the organizational attitudes and behaviors that support innovation.

Organizations manage their innovation activities and their relationship to strategic objectives through an **Innovation Portfolio**, a roadmap of potential activities and projects already underway. The Portfolio helps manage the overall

innovation process in a broad organizational context, allowing organizations prioritize the allocation of resources and manage risk across all aspects of the business. Research conducted by the Doblin Group has demonstrated the benefits of innovating across the entire value chain of an organization, not just in a single area such as R&D or new product development, and the Portfolio Management approach provides the framework and a toolset to ensure the methods are properly applied.

Innovation Management Technology (IMT)

Given the importance of having a managed process, technology can bring many benefits to innovation initiatives. Technology allows the process to scale, allows companies to replicate best practices, and provides a channel for potentially all employees—and people outside the firm with diverse disciplines and experiences—to provide input to this vital corporate activity, thereby maximizing the use of the enterprise's intellectual assets. Other benefits include providing structure, repeatability, and discipline to a process that is often viewed as mysterious.

IMT encompasses the tools that support the innovation process throughout the Pipeline, covering everything from online virtual networking to project management software for new product development. The main classes of software that support the pipeline are Web-based Idea Management (used at the front-end of the process up to the Project stage), and Stage-Gate or Product Lifecycle Management (PLM) software, covering the Project Phase and beyond.

Web-based Idea Management

This is a holistic tool-set that allows companies to tap into the wealth of ideas and knowledge across the enterprise and beyond. Idea Management is necessarily people-centric and care is needed in the design and implementation of a corporate-wide program.

There are two main types of Idea Management programs: ongoing and event-driven. The ongoing approach, akin to the old-fashioned suggestion box, is designed to collect a broad range of ideas in a central place, and the administrator of the system is responsible for a triage process of sending the ideas to appropriate managers for review and subsequent implementation. The event-driven approach is more directed by business strategy and objectives, with narrowly focused idea collection and time-bounded collection and idea evaluation.

Although both methods can be successful, the event-driven approach yields 10- to 30-fold more high quality, high impact ideas than the always-open approach (Imaginatik Research). The method underpins a supportive innovation culture, and provides the all-important process channel that allows the company to derive value from the process.

In both types of Idea Management, the process involves idea collection, some form of collaborative insight and idea development, usually through a network of peers, and finally idea evaluation and selection by management or a specific project team. The technique can be applied to many business challenges across the enterprise, such as new product development, product commercialization, process improvements and cost reduction, and new business model creation.

Mini-Case BMS: In 2001, Bristol-Myers Squibb faced the impending loss of the core patents on Glucophage, its blockbuster diabetes drug. The company had already developed new formulations that would provide significant customer benefits. The challenge was to make doctors and patients aware of the products, and to encourage people to switch to the new variants. In the past, the company had relied on internal small-group brainstorming or on the advice of their marketing agencies, but for this project they decided to run an Idea Management ‘event’ to gather ideas and insights from 3,000 sales and marketing employees worldwide. The process of idea gathering and evaluation was managed with an online Idea Management system. (Imaginatik) The system gathered over 500 ideas, and the project team, led by the Glucophage Product Manager, selected 12 top concepts for implementation. By early 2002 the successfully implemented employee ideas had added \$200MM to the forecast launch revenue of the new products. (InformationWeek, 2002)

Innovation Management Technology: A Catalyst for Change

We saw earlier that a supportive culture is required for an enterprise to respond to a challenge or opportunity with agility. Corporate leaders must repeatedly send out signals to the organization to underpin the necessary cultural attributes. IMT, by clearly incorporating a fair recognition and reward system, can be effective in this regard. For example, one of the keys to a successful Innovation Management program is reward and motivation for all participants. The issue is how to motivate people to take time out of their normal work to think about and develop potential

solutions for business problems that may sit outside their domain of expertise. Research has shown that the best methods of incentive focus on intangible rewards, such as management acknowledgement and peer level praise. (Kohn, 1999) Rewards must be disassociated from the value of an idea. Ideas can take years and cost millions of dollars to implement, and it is not fair to over-reward the original ideator. Programs that highlight financial rewards tend to encourage negative behaviors that can destroy a supportive culture. While it is possible to design a program to avoid most of the financial problems, these methods are expensive and yield little reward.

Mini-Case American Airlines: For 13 years, American Airlines ran *Ideas In Action*, a company-wide initiative to collect and reward cost saving ideas. The program generated over \$500MM in net benefits over the life of the program. Even so, the program was not deemed overwhelmingly successful. Employees could earn thousands of dollars worth of bonuses for their contributions, but the focus on financial rewards meant that the program required auditors, cost accountants, and many layers of program management. At its high point, the program employed almost 100 people. After September 11, the program was disbanded and replaced with a new program, *Ideas In Flight*. This program offered no financial rewards for ideas. Fortunately the new program proved even more successful than the previous program, yielding double the annual benefits in the first year. Apparently employees were motivated more by saving the company, than making themselves a few dollars. (Basex Conference, 2002)

IMT also supports another key cultural attribute—teamwork—as the best ideas usually combine insights and knowledge from several areas. Online software tools support cross-functional collaboration, combining ideas both from innovators and from doers that can be in different departments and dispersed around the world. The people-centric nature of the innovation process means that software needs to be carefully designed to manage underlying psychological behaviors. For example, some individuals prefer critiquing other people's ideas rather than generating their own ideas. This input may be valuable, but the software and process need to adapt to the way people really work.

IMT also enables metrics. It is a truism to say that *you get what you measure*, and this is just as important for innovation initiatives as for any other corporate function. There are several methods of measuring the success of an innovation

initiative, from assessing the results from specific ideas generated through the process, to comparing the efficiency of the process compared with alternative methods. Most top companies have adopted composite metrics to assess their innovation performance. Simplistic measures such as *patent submissions* or *revenue from new products* tend to be one-dimensional and negate the benefit of the holistic innovation approach.

CONCLUSION

This chapter has argued that innovation for every enterprise is not a luxury but a necessity. As protective barriers disappear, knowledge becomes freely accessible, and changes in business environments accelerate, the nature of innovation is subtly shifting. An agile enterprise must create a culture that supports *holistic* innovation in which all functions continuously interact to produce new business configurations and relationships. Business model innovation is taking over from the uni-dimensional product or service focus of the past. You, as leaders, must embrace enterprise-wide innovation. You must apply new tools to manage this complex process and show, by example, the importance of cultural values required for real-time holistic innovation. In this way, you will build a corporation that can innovatively harness all of its resources to respond in real-time to unexpected threats and opportunities.

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6

AGILE ENTERPRISES AND OFFSHORE OUTSOURCING



RAVI KALAKOTA, CEO, e-BUSINESS STRATEGIES

INTRODUCTION

Change. It comes in all shapes and sizes, and since the turn of the century best-practice organizations have been adapting to it without pausing for breath. The capacity to handle change and to manage its effects internally and externally is what separates the adaptive enterprises from the inflexible ones, the market leaders from the market losers. What are the changes that are preoccupying companies worldwide? Globalization, standardization, and outsourcing to name but a few.

In this chapter, we discuss offshore outsourcing, one mechanism that agile companies can use to help them adapt to economic shocks and changes and still come out on top. Outsourcing business processes or information technology to lower-cost destinations the world over is a trend that has gathered great momentum in recent years. Customers who want more of everything for less money are the driving force behind the trend. If they value cost, they want it lower. If they value speed, they want it faster. If they value convenience, nothing less than 24/7 will do.

With corporate budgets pared down from the highs of the 1990s, companies are eager to please customers but have fewer resources (capital, labor, and technology) at their disposal. Managers have to *do more with less*. Enabled by the Internet, an increasingly interlinked global economy, and reduced international trade barriers, offshore outsourcing is one of the numerous agile methodologies that companies have embraced in order to conform to that mandate.

This chapter defines offshore outsourcing, the business processes that organizations are sending offshore, and the business models (both first generation and second generation) that they are using to become more agile. (Robinson and Kalakota, 2005)

WHAT IS OFFSHORE OUTSOURCING?

Offshore outsourcing is the delegation of administrative, engineering, research, development, or technical support processes to a third party vendor in a lower-cost location. It can also include the re-engineering of processes. The term *re-engineering* in the context of offshore outsourcing refers to a strategy of developing new process designs and solutions in order to eliminate business performance problems.

Before we delve deeper into the offshoring trend, it is important to differentiate offshoring from business process outsourcing (BPO), which involves the migration of services to an external provider. A common misconception is that all offshoring involves outsourcing. This is not true. While outsourced processes are handed off to third party vendors, offshored processes can be handed off to third party vendors *or* remain in-house. The definition of offshoring includes organizations that build dedicated centers of their own in remote, lower-cost locations.

Offshore outsourcing encompasses manufacturing, IT, and back-office services. Manufacturing outsourcing began in the 1970s and 1980s when U.S. jobs in steel and textiles shifted from the north to the south. In the 1990s, manufacturing facilities in Mexico, Puerto Rico, Canada, South Korea, and Taiwan began to proliferate and absorb much of the consumer electronics and personal computer production. In the late 1990s, Southeast Asian countries like Malaysia became key areas for manufacturing. In the 2000s, China has become the favored destination with unbeatable labor costs.

Information technology outsourcing (ITO) has followed a similar pattern. In the 1990s, companies began offshoring application development and maintenance, especially Y2K work. With the urgency surrounding Y2K, companies could not find enough IT resources onshore, so they hired offshore firms. The Y2K work soon grew to include mainframe, e-commerce, and enterprise resource planning (ERP) programming. In the early 2000s, IT outsourcing expanded to other processes such as help desks and technical support. Originally, companies headed for Ireland, but as Ireland became more costly, they changed course and went to India.

Business process outsourcing—call centers, finance and accounting, human resources, and transaction processing—has followed a different pattern. In the 1990s, there was a tremendous movement in corporations to consolidate various fragmented divisional activities and create shared services centers (SSCs).

An SSC is essentially a *do-it-yourself* insourcing model in which a large firm sets up its own dedicated service operation to handle tasks such as customer care or transaction processing. Some of these SSCs began to migrate offshore. The companies that pioneered the offshore SSC model, such as GE and American Express, understood that they could realize more value if they based these centers in low-cost countries. The actions of these early innovators have led to a steady rise in the number of large corporations establishing back-office processing centers in countries like India, the Philippines, South Africa, and Russia.

The emerging trend of offshoring business processes (or white-collar work) represents a fundamental structural adjustment, not a short-term business cycle phenomenon. The experience of manufacturing illustrates that when it is possible to do things cheaper elsewhere in the world, the work will migrate there. For instance, tough-to-beat labor and overhead costs have made China a top choice for almost all types of manufacturing. **With the relentless pursuit of the lowest global costs, offshoring is becoming institutionalized at many companies.**

Examples of Offshore Outsourcing

The practice of offshore outsourcing is slowly but surely becoming an entrenched part of modern management. In fact, it would be hard to find a senior management team in any large corporation that has not thought about investigating or prototyping an offshore project to see whether it is right for them.

In this subsection, we describe a variety of offshoring endeavors. All highlight the basic tenet that business flows to the areas with the lowest cost.

Back-Office Offshore Outsourcing at HSBC Holdings

HSBC Holdings, one of the world's largest banks, has over 9,500 offices in 80 countries across the globe. HSBC is under increasing pressure from Citigroup to remain competitive on cost. The corporation already runs a number of global processing hubs in India and Malaysia. Recently, it announced plans to migrate certain business tasks—mainly processing work and call center inquiries—to India, Malaysia, and China.

Accompanying the migration of these tasks is the relocation of 4,000 jobs, one of the largest overseas transfers of British jobs. HSBC's decision mirrors similar offshore outsourcing moves by other British companies such as British Telecom, Aviva, and Prudential.

In the world of financial services, offshore outsourcing was once regarded as a short-term solution for problems such as sharp or unexpected rises in demand or shortages in programmers. Today, financial services companies ranging from retail and investment banking, life, auto, and mortgage insurance businesses, to credit card processors and brokerage companies view offshore outsourcing as a key element of their overall corporate strategies.

Customer Service Offshore Outsourcing at Amazon.com

Amazon.com commenced operations on the Web in July 1995. Since then, the online retailer has accumulated approximately 45 million customers across a variety of sites. As Amazon.com continues to attract new customers from all over the world, it has become important to have trained support staff ready to respond to the many customer questions and inquiries no matter what time of day or night.

To reply to customer e-mails faster, Amazon.com selected Daksh in June 2000 to provide e-mail customer service from India. Amazon.com expects Daksh to respond to 95% of e-mails received in 24 hours and 100% within 48 hours. Several hundred Daksh professionals work exclusively for the retailing giant. Amazon.com also bought a 10% equity stake in the company.

The rationale for this e-mail offshoring decision: Amazon.com pays a full-time customer service rep based in the United States an average of \$2,000 per month whereas an equivalent rep in India costs \$150–\$200 per month. Although companies cite multiple reasons in their decisions to offshore, cost remains a major driver.

In April 2004, IBM announced that it would acquire Daksh and absorb its 6,000 employees into the IBM Business Consulting Services group. This move will help IBM bolster its contact center outsourcing capabilities and provide a stronger foothold in India.

IT Offshore Outsourcing at Cadence Design Systems

As the world's largest provider of electronic design automation products, Cadence Design Systems helps companies bring their ideas for electronic products to life. It does design work for businesses that manufacture items such as semiconductors, computer systems, telecommunications and networking equipment, as well as mobile and wireless devices.

With most of its customer base adversely affected by an economic downturn, Cadence had to work much harder to sell its products. To reduce IT costs, Cadence outsourced some of its application development to Aztec Software. When the project began, Aztec sent ten software engineers to Cadence's California location to support its design team. The two groups worked to pinpoint what

would make the project a success and to get comfortable with each other's work styles. Aztec had to understand Cadence's processes, infrastructure, and reporting before it could move any work to headquarters in India.

Eventually, Aztec began moving the work to Bangalore piece by piece, and the group dedicated to the project increased to 38 people. Currently, two Aztec staffers remain in California and 35 work offshore from India.

Faced with economic gyrations and an urgent need to enhance competitiveness, more adaptive enterprises are choosing the path Cadence chose—to offshore. For growth-oriented companies like Cadence, offshore outsourcing also offers instant capacity and financial flexibility as the business expands and contracts.

Finance and Accounting Offshore Outsourcing at General Motors

General Motors (GM) has outsourced several finance and accounting (F&A) processes from its North American and European operations. In 2001, Affiliated Computer Services (ACS) signed a ten-year outsourcing contract with GM, agreeing to take over and execute the automaker's accounts payable (AP), accounts receivable (AR), payroll, travel and expense, and cash management processes.

GM's goal: achieve considerable cost reductions and improve quality and control. The company is leveraging ACS's capability to perform transactional activities. ACS provides its services from centers in Arizona, Jamaica, and Spain. GM monitors the quality of ACS's work with the aid of numerous controls: service level agreements, desk procedures, internal and external audits, onsite quality assurance teams, segregation of duties, delegation of authority, and process risk validations.

GM was not the first to blaze this path, and it will not be the last. Other leading organizations such as British Airways and Ford have seized the F&A outsourcing opportunity as a method for saving money, substantially improving service levels, and redeploying resources to initiatives that generate profitable growth. Faced with high internal F&A costs, more and more companies are looking at offshoring as a way to free up staff to focus on strategic aspects of operations.

THE OFFSHORE OUTSOURCING PROCESS LANDSCAPE

As the HSBC, Amazon.com, Cadence, and GM examples show, the processes that companies can select for offshore outsourcing are as diverse as the business world itself.

The offshore business process landscape is complex and varied, but the business processes that companies are sending offshore do fall into five main

categories. They include information technology, customer care, finance and accounting, human resources, and transaction processing (see Figure 1). Although companies do outsource manufacturing and supply chain management, in this chapter we have chosen to focus on the five most widely outsourced categories of business processes.

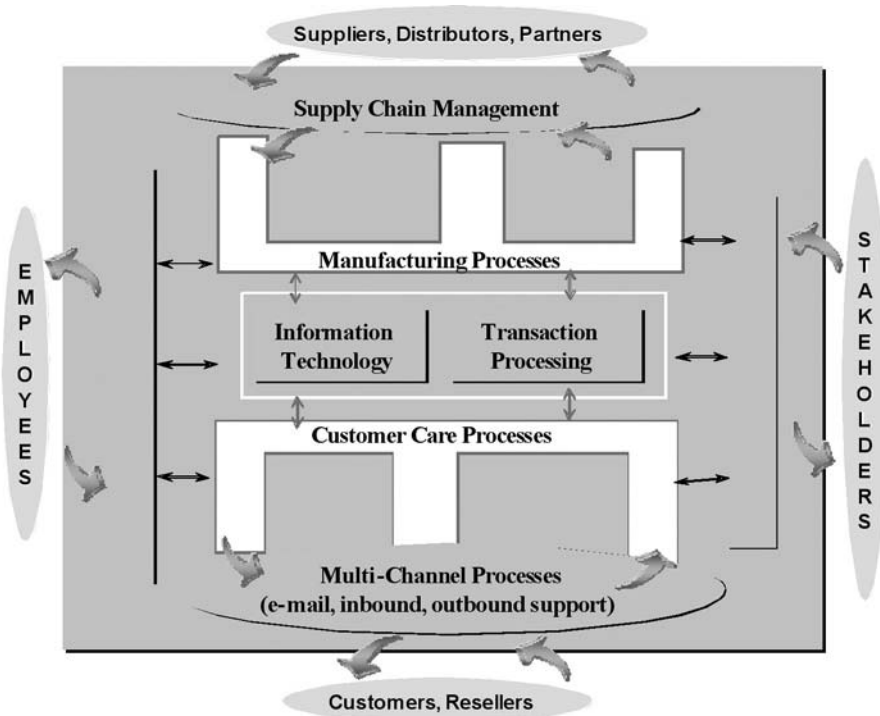


Figure 1. Offshore Process Landscape

Information Technology Processes

Information technology companies were the first to move into the offshore sector. Back in the mid-1980s, the model was to use offshore labor for low-end, low-cost work such as language localization, device and printer drivers, and motherboard production.

However, as the offshore outsourcing phenomenon took off, Fortune 1000 companies started contracting with offshore companies to do other types of work like Y2K remediation. The focus gradually shifted to application maintenance, support of existing products, and, eventually, new application development. Today, the range of possible IT processes that can be offshored includes:

- **Application development**, which spans designing, developing, and installing software for a variety of IT systems. Applications range from single-platform, single-site systems to multiplatform, multi-site systems. A project may involve the development of new applications or new functions for existing software applications. Each development project typically involves all aspects of the software development process, including definition, prototyping, design, pilots, programming, testing, installation, and maintenance.
- **Application maintenance**, which is usually for large software systems that need modifications, enhancements, and product support. It includes migrating to new technologies while extending the useful life of existing systems. Projects may involve re-engineering software to migrate applications from mainframe to client/server architectures or port existing operating systems to Unix or Linux. For companies with extensive proprietary software applications, implementing such technologies may require rewriting and testing millions of lines of software code.
- **Application testing**, which focuses on critical aspects such as quality assurance, building automated test suites, performance metrics, capacity planning for peak business demands, validation testing, test automation, execution, defect tracking, and reporting.
- **Support services** for constantly changing applications and technology that span help desks, scheduled maintenance, security issues, remote diagnostics, and documentation development.
- **Implementation services**, which are end-to-end application hosting services that allow customers to transfer the responsibility of maintaining, enhancing, and managing custom and packaged applications to the vendor. They also include product lifecycle management, prototype development, technology evaluation, proof of concept, application hosting, and training.
- **New product engineering services**, which encompass Web Services design, product and process analysis, and simulations and range from basic changes to complex designs. In addition, they may involve customizing the latest object-oriented design, modeling, and engineering software to specific user requirements.

Google, the innovative search technology company that connects millions of Internet users every day with the information they seek, is heading offshore. Google plans to open its first offshore engineering R&D center in Bangalore, India. Some companies not as adventurous as Google may be reluctant to

outsource the development, support, implementation, or maintenance of IT, especially mission-critical IT applications and systems. They may be more willing to consider sending some aspect of their customer care operation offshore.

Customer Care Processes

The customer of today is very different from the customer of yesterday. With each passing day, customers gain more knowledge and, consequently, more demands for companies.

The Internet created a new customer who is armed with more intelligence about prices and greater service expectations and is driving companies to focus efforts and money on customer care. Within the process category of customer care, there are many subcategories ripe for offshoring.

- **Support** includes responding to the customer's initial inquiry, product question, request for a status update, invoice query, or order confirmation. Most of these issues are handled through contact centers via voice-based phone support, e-mail, or live chat.
- **Marketing** provides comprehensive marketing functionality such as direct mail marketing campaigns, telemarketing, telesales, lead qualification, lead tracking, and customer surveys.
- **Sales** supports cross-selling and up-selling opportunities, inbound and outbound sales, acquisition programs, campaign management, and retention programs.
- **Technical support** assists customers with resolving product or service problems.
- **Customer analytics** provides content and applications to measure, predict, plan, and optimize customer relationships.

Technical support and help desk are often the first customer care processes to go offshore. However, this is not as easy as it appears. In December 2003, Lehman stopped using Wipro Spectramind for its internal IT help desk. Lehman wasn't satisfied with the level of service it received and brought the help desk function back in-house. Offshoring technical support, while attractive, can be fraught with pitfalls if not planned carefully. Experiences like Lehman's might persuade some companies to keep customer care in-house and opt for offshoring finance and accounting processes instead.

Finance and Accounting Processes

From accounting to travel management, firms need to analyze voluminous data sets to understand, report, and generate value. Within this process category, many subcategories can potentially be offshored.

- **Transaction processing** enables enterprises and their business networks to handle customer- and supply chain-related financial processes. Accounts payable, accounts receivable, credit management, bill presentment and payment, in-house account management, cash and liquidity management, and dispute management are typical transaction processing subprocesses.
- **General accounting** records quantities and values from financially relevant transactions and maintains a consistent, reconciled, and auditable set of books for statutory reporting, management support, and use as a source for analytic applications. Subprocesses include general ledgers, bookkeeping, and project accounting.
- **Financial management** encompasses financial statements, revenue and cost accounting, and product and service costing.
- **Financial reporting** supports greater transparency in financial reporting, performance monitoring, integrated strategic planning, business consolidation, and effective stakeholder communication. Typical subprocesses include financial reporting, sales tax filing, shareholder services, and budgeting and forecasting.
- **Tax related processing** is dependent on the general ledger, which is a collection of all balance sheets, income, and expense accounts. General ledger reports, local and federal tax returns, W-2 forms, and unemployment tax returns are the subprocesses housed under tax processing.

Procter & Gamble was an early adopter of offshore tax processing. The corporation has approximately 650 employees in the Philippines who help prepare P&G's tax returns around the world. All of the processing can be done in the Philippines with just the final return submitted locally to the various tax authorities. Offshore finance and accounting strategies have helped many companies like P&G sharpen their focus on core capabilities; however, there's always offshore human resources, to consider if organizations aren't eager to send out finance and accounting work.

Human Resources Processes

Human Resources (HR) is a complex business function that covers a range of processes, from recruitment and retirement to basic transactions and workforce development.

The initial targets for HR offshore outsourcing are the HR departments of the Global 500 companies. According to *Fortune's* Global 500 list for 2002, large corporations employed more than 47 million people; the median number of employees for these corporations was approximately 63,000, in multiple locations and countries. An employee base of this magnitude presents enormous complexities: Multiple HR groups for different business units exist, and corporations lack central information repositories or integrated HR technology infrastructures. Simplifying this complex organizational structure and lowering the cost of providing employee services is the primary driver of HR outsourcing.

The HR process category contains many subcategories that can be offshored.

- **Compensation services** involve managing deferred compensation, stock options, and long-term performance; analyzing payroll data; keeping track of attendance; recording and paying payroll taxes; and issuing payments to employees.
- **Benefits management** spans a broad range of services that include managing health, medical, 401(k), pension, and life insurance plans; overseeing eligibility and vacation schedules; tracking leave; maintaining retirement earning histories; and supervising the enrollment and termination of benefits.
- **Employee relations** is based on companies' efforts to promote and maintain effective relationships with all employees. This includes capabilities that enable employees through a variety of channels (help desk, Web portal, and voice) to conduct day-to-day transactions. Specific tasks include employee development, employee record management, employee communication, labor management, local compliance issues, training needs identification, training administration, and specialized training requirements.
- **Workforce management** covers the creation of strategies that help to effectively deploy and measure human capital. It also includes developing candidate pools, assessing and selecting candidates, and managing recruiting. For large multinationals, recruiting and workforce planning involves establishing and administering expatriate and domestic relocation

policies and programs, addressing and managing the special needs of the expatriate employees, and handling the repatriation of employees.

Cisco Systems, the worldwide leader in networking, offshored payroll processing and employee query resolution issues to Crossdomain Solutions. Crossdomain specialists handle payroll, reimbursement processing, queries, and remittances. For those companies that don't envision themselves following Cisco's lead in offshoring HR processes, one last category exists: transaction processing.

Transaction Processing

While back-office transaction processing may be boring, the accuracy and timeliness of the information it delivers are the legs upon which today's companies stand.

As the offshore market matures, back-office services are becoming more specialized and vertical-specific. For instance, in the mortgage industry, companies are outsourcing loan processing. In healthcare, companies are outsourcing medical transcription and medical record administration. In insurance, companies are outsourcing claims processing and policy administration.

In the world of offshore transaction processing, American Express is considered a best practice. By moving its transaction processing offshore, the company has created tremendous efficiencies in its internal back-office services. American Express's offshore presence also gives it the ability to manage membership growth and still keep operating costs in check.

At this point, companies may have tentatively identified the process that they wish to send offshore. Their next step is to determine how to execute their offshore project by selecting the business model that enables them to be more agile.

Executing Offshore Outsourcing

A great number of diverse organizations are offshoring business processes. To better understand the different business models, it is important to familiarize yourself with the two dimensions of every business model:

1. Ownership or relationship structure (subsidiary, joint venture, or external vendor), and
2. Geographic location of the work (onsite, offsite onshore, or offshore).

In the next section, we explore the various business models that emerge from the different combinations of relationship structure and geographic location.

Ownership Structure: External Vendor, Joint Ventures, or Subsidiary?

A crucial issue in ensuring future offshoring success involves selecting the most appropriate ownership model. There are three different general relationship structures for outsourcing engagements:

1. Pure contract offshore outsourcing (buy or third party)
2. Joint ventures (partnership agreement)
3. Fully owned captive subsidiary (build it or insource)

Clearly, there is a wide spectrum of ownership structures available with particular advantages and disadvantages for each. Let's look at them in more detail.

Pure Contract Offshore Outsourcing

Pure contract offshore outsourcing is the phrase used to describe a company that relinquishes control of a function to an external service provider in a foreign country. The external service provider takes over the function and does much of the work offshore using cheaper labor. Contract outsourcing can lead to three different models:

1. **Selective outsourcing** in which firms only send out a small subset of their business process activities. The Delta Air Lines/Wipro Spectramind relationship provides a good example of pure contract offshore outsourcing. Delta elected to offshore select call center services to Wipro Spectramind.
2. **Transitional outsourcing** in which firms temporarily hand over a function to a third party vendor and bring it back in-house later. GE and Satyam Computers had a transitional outsourcing relationship.
3. **Total outsourcing** in which external vendors take over the business process and do whatever the organization was doing at 20%–30% less. The BellSouth/Accenture outsourcing agreement exemplifies this last model. BellSouth outsourced IT work to a facility run by Accenture in India.

Pure contract offshore outsourcing is a make-versus-buy decision. Its chief advantages are limited operational risk, the potential for cost savings, and the

rapid speed at which it can be executed. Typically, it is faster to implement an outsourced project than it is to implement a joint venture or captive center.

Joint Venture

A joint venture (JV) is the product of two or more companies pooling their combined resources to create a new entity to perform a business project together for a set period. JVs attempt to create common goals through joint equity ownership.

What is unique about JVs is their independence. They have their own management and the organizational freedom to develop a culture and practices different from either parent. From a benefit perspective, JVs are attractive since they can save both parents money because expenses, resources, and workload are shared.

GE and Satyam Computers formed a joint venture in December 1998. The GE/Satyam Company provided a GE industrial systems affiliate with engineering design, software development, and system maintenance services. In 2003, Satyam sold its interest in the JV after GE exercised its option to purchase Satyam's interest for \$4 million.

Captive Offshore Subsidiary

In the past, companies pursued the offshore path via joint ventures. As business evolved, companies eventually discovered that it was better to build their own subsidiaries. Firms began to establish captive offshore subsidiaries or foreign subsidiaries that completed all the BPO work themselves.

Companies that select this ownership model tend to cite reasons of more control and flexibility and lower prices on a long-term basis. Cultural issues are also a factor. In some instances, firms may wish to maintain control of the output by using a model that is more aligned with their internal culture.

Some of the companies that have captive subsidiaries in India include HSBC (Hyderabad), American Express (New Delhi), British Airways (Mumbai), Citibank (Chennai), and Dell (Bangalore).

Location of Work: Onsite, Offsite, or Offshore?

Geographic location plays a key role in structuring outsourcing business models. Outsourcing can either be done onsite (on the premises), offsite (outside the premises but in the same country), or offshore (outside the premises and outside the country).

Global companies such as Electronic Data Systems (EDS) tend to blend all three location models. In March 2003, EDS fired its CEO, Richard H. Brown,

after disastrous third-quarter results. Upon his arrival, the new CEO, Michael Jordan, immediately began to take steps to make EDS more competitive against the low-cost outsourcing competition.

EDS, which makes the bulk of its revenues by running the back-office operations of big corporations, was losing ground to lower-cost outsourcing firms such as Wipro and Infosys. To improve its competitiveness, EDS moved quickly to lower its cost structure. It increased its head count in India, Argentina, Malaysia, Hungary, and Mexico, the countries in which it expects to have more than 10% of its workforce of 137,000 employees by year-end 2004.

EDS is also hard at work creating a global delivery model that increases customer choice. EDS's Best Shore initiative blends the onshore, nearshore, and offshore models, matching clients to different development or solution centers according to their particular requirements (industry, technology, or location). EDS predicts it will employ 7,200 individuals in its 16 global Best Shore solution centers.

Onsite Outsourcing

This location model mandates that all processes, starting with information gathering and ending with implementation, be carried out at the client's premises. The third party provider utilizes its own workforce to service clients on their premises. This model ensures clients greater project control. It is also suitable for those projects that are mission-critical, location sensitive, and require constant attention.

Offsite Outsourcing

This location model hinges on the service provider having an office onshore. The project or work may be done offsite, but it's still in the same country as the client. Not only is the offsite center close to the client, it may be used to provide support to an onsite team. Thus, the experts at the offsite center work in tandem with the corresponding onsite team to ensure timely, quality service.

Nearshore or Offshore Outsourcing

This location model dictates that the project-related activity is done at the vendor's premises nearshore or offshore. For U.S.-based companies, nearshore is countries such as Canada, Mexico, or Costa Rica while offshore is countries such as India, China, or the Philippines.

This model is best in instances when the project plan is well defined and the offshore team has a clear understanding of client requirements. The high level of risk associated with this model becomes an issue for some clients. One risk associated with this model is the communication gap between the vendor and client, which may result in the client's requirements not being captured accurately. Some analysts are of the opinion that a 100% offshore model is not workable.

The bottom line: Numerous ownership and location options are available. Executives can use supplemental staff, temporary workforces, consultants, or contractors. They can outsource — hire external contractors to do all or some of the work. They can pool resources through strategic alliances and share in the results. Or they can meet their needs by creating entirely new entities through joint ventures with one or more partners.

To understand which business model (i.e., combinations of ownership and location models) is right for you it is useful to understand the nuances of what's being implemented by various companies.

First Generation Business Models

The many combinations of location and ownership structures give rise to several distinct business models (see Figure 2). In each model, the relationship between the client and provider is structured uniquely.

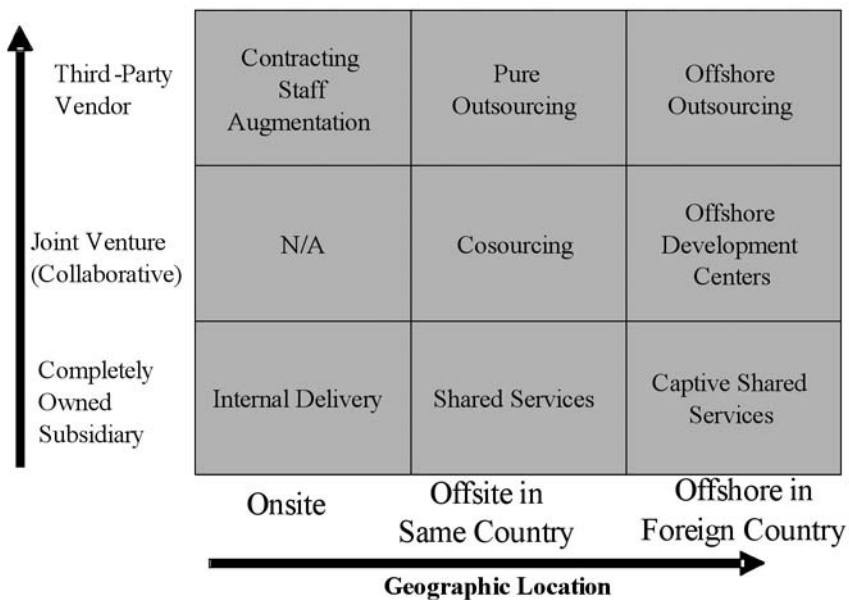


Figure 2. First-Generation Offshore Business Models

Internal Delivery (Department-Based Model)

This is a delivery model with which every manager is familiar. In this model, an internal department provides services—finance and accounting, human resources, or IT support—to other business units and implements new services through internal projects. The internal department and business unit involved manage the

relationship directly. Internal delivery is the most flexible model because the unit manager may change the rules and the processes as much and as often as needed. Nevertheless, it is also the most limited sourcing model with regard to scale (dimension of operations) and knowledge (experience, innovation, and available additional resources).

Offsite Onshore Shared Services

The shared services approach eliminates the duplicate processes, activities, and staff that individual business units have and brings them together to achieve critical mass. Paying for each business unit to manage its own finance and accounting, human resources, or information technology support is costly. These *cost center* functions while necessary are not strategic. It makes more sense to consolidate these non-strategic processes and generate economies of scale.

Companies execute the shared services model by bundling selected supporting processes and activities into a separate division or organization. This entity treats these processes as its core business and is measured by its own unique profit and loss (P&L). Bundling services into an independent organization, means that some or all of the employees who support them also have to move to the new entity.

Offshore Captive Shared Services

Taking the shared services and housing them offshore leads us to the captive shared services delivery model. The product of this *do-it-yourself* offshore model is a center set in a foreign country that is dedicated to serving the different business units or sales, general, and administrative (SG&A) functions of a large company. This model is very common in multinational firms that wish to control their BPO operations, quality, and intellectual property.

American Express was among the first to establish a back-office, captive shared services center in India in 1993. Other companies that have followed suit include British Airways in 1996 and GECIS in 1998. Since 2000, a growing number of Global Fortune 500 firms including AOL, Citigroup, Dell, Hewlett-Packard, HSBC, and J.P. Morgan Chase have established captive operations.

Cosourcing

Cosourcing is the term that describes companies that execute a shared services center with an external vendor. *Cosourcing*, a fancier term for joint venture, is a collaborative relationship based on shared objectives that reflect the appropriate balance between control and flexibility. Cosourcing is a viable model for organizations uncomfortable with outsourcing a complete business process; outsourcing some parts to a joint venture with a vendor may offer a temporary or final solution.

The cosourcing model aims to combine the strength of the vendor and the client. That was the intent of AT&T and Accenture, who announced a five-year, \$500 million, cosourcing arrangement designed to transform AT&T's residential credit and accounts receivable management functions and provide new capabilities and efficiencies. In particular, the agreement is designed to help AT&T expand its service portfolio, increase marketing flexibility, improve uncollected receivables, enhance operational efficiency, and reduce costs.

On its side, Accenture will manage the integration of planning, initiative execution, and collections processes across multiple organizations within AT&T Consumer. Approximately 45 AT&T employees whose work is within the scope of the agreement will transition to Accenture. In addition, approximately 250 other AT&T employees will be part of the cosourced operation and remain on the AT&T payroll.

The cosourcing agreement has been structured so that AT&T will retain control of business planning, credit policy, and customer interaction. Accenture will lead the transformation program and be responsible for the credit risk management and collections functions. In addition, Accenture will build and deploy capabilities to enable AT&T to support its growth objectives while mitigating risk and reducing uncollectibles.

Cosourcing is an option when firms don't have the skills or the money to set up a shared services center on their own or simply don't have the management bandwidth given the magnitude of the other tasks on their plates. The advantage for companies that cosource is that they don't have to pay for everything upfront. The advantage for vendors is that they gain a guaranteed revenue stream.

Offshore Development Centers

In the software industry, joint ventures with offshore vendors are common, so common that the industry developed a term for them: *offshore development centers* (ODCs). An ODC is a dedicated, customized, and secure development center established by a vendor for a customer who needs to outsource substantial software development, maintenance, or engineering work. This model gives the customer more control but requires much more management attention.

In the mid-1990s, GE began a business-wide initiative to establish dedicated software and engineering development centers with several Indian vendors such as Tata Consultancy Services, Satyam, and Patni. Each vendor established facilities dedicated to GE with separate entrances, security, and firewalls in cities such as Mumbai, Bangalore, Hyderabad, Delhi, and Chennai.

These global development centers are extensions of GE's individual business IT or engineering teams and ultimately report to the CIO or engineering leader. The CIO reviews current suppliers, selects new ones, and negotiates contracts.

These centers have proved highly successful, growing from just over 600 software designers in 1995 to 6,500 in 2002.

In 2002, GE established two wholly owned software development centers (as opposed to the jointly owned centers we just described) to develop key in-house expertise for more highly valued and proprietary software. Increasingly, many U.S. technology companies are considering starting 100%-owned subsidiaries in countries like India instead of working with an offshore IT services vendor. The main reasons being:

1. The cost savings associated with an offshore subsidiary can be as high as 40% when compared to a vendor partnership
2. Direct control on hiring and retention of offshore resources
3. The ability to retain intellectual property within the company

Staff Augmentation, Contracting, or Temporary Services

The oldest onsite outsourcing model is staff augmentation, contracting, or temporary services. In this model, corporations leverage supplemental staff to contain costs and handle overflow work. Staff augmentation reduces the costs associated with hiring, benefits, and termination, as well as the expense of recruiting, training, and retaining personnel. In-house resources can be redeployed on revenue-generating and strategic activities.

The staff augmentation model can also utilize offshore resources. Actually, many offshore vendors first started as *body shops* that provided staff augmentation. These vendors thrived in the late 1990s when it was extremely difficult to find qualified employees.

Pure IT or Business Process Outsourcing

Pure outsourcing is the most classic of the first-generation offshore outsourcing business models. In this model, companies delegate one or more business processes to an external provider that owns, administers, and manages the processes based on predefined and measurable service level metrics.

Pure outsourcing is based on a multiyear (five- to ten-year) contract with a single vendor for all the in-scope services. It comes in two forms: *information technology outsourcing* (ITO) and *business process outsourcing* (BPO). In this model, vendors usually handle a large part of the customer's IT or process needs. The two reasons most commonly given by companies that select this model are (1) lack of staff with appropriate skills and (2) not enough time to do the job right.

The ITO model really began in 1988 when Eastman Kodak outsourced its corporate IT infrastructure (17 data centers and all its networks and desktop systems) to IBM. The ten-year deal was estimated to be worth \$250 million. Since

then, several companies, such as DuPont, GM, United Technologies, and Xerox have outsourced most of their IT infrastructure.

The advantages of this model are a lower cost of procurement, reduced management overhead, and service provider familiarity with client needs. The disadvantages are the captive or even exclusive relationship and the tendency of service provider investments to set the pace for innovation.

First-Generation Offshore Outsourcing

In this model, foreign companies come to the United States or Europe to sell projects. These projects are then executed completely offshore with local, low-cost labor. This model was first seen in contract manufacturing and then spread to IT. In the IT sector the tasks included Y2K remediation, euro conversion, software development, and application maintenance.

The first generation of offshore outsourcing was attractive for CIOs in the financial services, high-tech, and retail industries who did not want to hire in-house staff or expensive consultants to do simple tasks. In addition, the U.S. unemployment rate during the 1990s was very low, which made it hard to recruit employees. As a result, many organizations turned to offshore outsourcing vendors to take care of their staffing problems. This facilitated better utilization of in-house personnel. It also helped them to rapidly turn projects *on* or *off* based on business demand.

The first generation of offshore outsourcing did have some limitations. Its modus operandi was to throw low-cost talent at a variety of problems, which works well for defined commodity tasks that do not require much communication; however, in a business process environment (customer care or transaction processing) that requires ongoing interaction, the classic hand-off model is not a good match. Much more integration between the firm and the offshore vendor is necessary.

Second-Generation Models

As customer needs evolve, second-generation business models are emerging. They tend to be more sophisticated and to span multiple models of the first generation. These combination models include:

- Global delivery or blended outsourcing models (practiced by large global vendors)
- Hybrid delivery model (practiced by midsize and large offshore vendors)
- Global shared services center (practiced by large multinationals)

- Build-operate-transfer (BOT) model (practiced by risk-averse corporations)
- Offshore multisourcing model (practiced by experienced conglomerates)

Global Delivery Model

A global delivery model (also called blended outsourcing) is one in which a company outsources to a multinational service provider such as Accenture, Unisys, EDS, or IBM that offers a mix of onsite, offsite onshore, and offshore resources. The global delivery model allows vendors to distribute and manage engagements across multiple global locations. The advantage of this model is that the company initiating the outsourcing receives a lower rate without the risk. If faster time to market is a primary delivery objective, the global delivery model can accommodate this requirement by divvying up work efforts across onshore, nearshore, and offshore development facilities. Large corporations that hire global outsourcers such as Sykes, SITES, Convergys, Wipro, or Infosys often prefer this distributed approach. The distribution of outsourcing activities may vary according to the demands of the project.

Vendors have a variety of marketing names for the global delivery model: best shore, any shore, right shore, and multi shore. Whatever it is called, its objective is the same: to distribute and manage engagements and resources across multiple locations, thereby allowing the service provider to better respond to client requirements. If disaster strikes any of the vendor's locations, it can shift work to other locations so that there is no interruption in business processes.

The biggest advantage of the global delivery model is that it saves the client from investing in a huge team of employees for multi-location projects. It adapts to the client's changing requirements and, if there is a sudden need for more resources, the service provider can supply them at once to the client and later relocate them to other, more convenient locations.

The global delivery model is the preferred model of choice for large consulting companies. Their close customer relationships and domain knowledge have made them formidable competitors. They can quickly enter markets such as the Philippines and take advantage of the low-cost labor. Their capabilities and customer bases permit them to scale up their offshore operations rapidly.

Hybrid Delivery Model (Onsite and Offshore)

Hybrid outsourcing combines onsite and offshore services to deliver results at reduced cost. The hybrid outsourcing model, also known as the dual-shore model, is becoming the business model for midsized service providers headquartered offshore in countries such as India.

How does this work? Consider the case of a software development project: The local onsite team manages the project's program management office (PMO) and handles the client-facing components of the project, such as requirements gathering and user-interface development. The onsite operation may control a defined portion of the project that requires interaction with the business subject matter experts and software architects onsite. The offshore facilities take care of the coding, testing, and bug fixing so work can be performed around the clock. In a dual-shore model, requirements gathering and the development of detailed specifications is done onsite, while programming or process work is done offshore. This model maximizes efficiency in resources and costs. Ideally, 20%–30% of work is done onsite whereas 70%–80% is outsourced offshore depending upon the criticality of the project.

This model is one of the most popular to have emerged so far. Its proven benefits include continuous, near 24-hour work cycles; the ability to structure and assemble teams with diverse, multiple skill sets; lower-cost resources; and the ability to quickly scale (up or down) depending on the requirements. Part of its success can be attributed to the fact that this model enables clients to directly interact with the service provider through the onsite team and simultaneously enjoy the benefits of offshore outsourcing.

This model has its own set of challenges including project management and administration costs, optimization of cross-cultural communication, and the supervision of onsite teams.

Global Shared Services Model

Global shared services centers, also known as captive centers or offshore insourcing, are a combination of onshore-shared services and offshore captive centers. The objective is to consolidate the scattered, autonomously run internal services operations of a multinational organization into mega-service centers. Another objective is to create a customer-focused mind-set, which enables high-quality, cost-effective, and timely service. The global center is run as an independent business, with its own budget and bottom-line accountability. GE, HSBC, and American Express are considered by many to be the most sophisticated in deploying this model.

How does this work? To understand this model better, let's study the best-practice example of GE Capital International Services (GECIS). GECIS provides back-room services to GE Capital businesses and GE industrial businesses at significantly lower costs and higher quality levels. GECIS began with simple data processing and has moved up the value chain to support more complex processes from diverse businesses across GE. GECIS has nine Centers of Excellence (CoEs)

in the following areas: finance and accounting, insurance, collections, customer fulfillment, industrial and equipment, analytics, learning and remote marketing, IT services, and software.

Captive shared services centers have significant advantages. First, they have guaranteed markets for their services and an established management hierarchy. They also alleviate some of the organizational issues such as control and politics that crop up when firms relocate back-office activities offshore to external vendors. Multinational captive centers are leading the way in the establishment of the global shared services business operations.

Build-Operate-Transfer Model

For many of the companies that have started their own foreign subsidiaries, the process has not been as smooth as they expected. They faced obstacles—legal, taxes, hiring, and management—from start to finish. While some companies have taken a long time to attain a steady state, some are still struggling, and a few even closed their operations.

The rise of captive subsidiary failures led to the evolution of a new business model in the offshore services industry called *build-operate-transfer* (BOT). In this model, a firm contracts with an offshore partner to build a shared services or offshore development center and operate it for a fixed interim period.

The logic behind the BOT model: The offshore partner can initiate operations and reach operating stability much faster than it can with an in-house effort.

A typical BOT is built and managed in three phases:

1. **Build.** The offshore partner provides a complete solution for building a presence in a particular country. The clients receive their own office space and establish their own brand identity at a lower price than comparable outsourcing arrangements. The vendor's staff takes care of all administrative and legal issues, from real estate, utilities, and permits, to computers, communications, and office supplies. The vendor also provides the professional support staff and operating licenses to run functions such as call centers.
2. **Operate.** The offshore partner provides a comprehensive set of operational management services, from HR and staffing, to accent training, accounting, payroll, legal, facilities, and security. The clients are able to focus their management time on their core business rather than on operational issues.
3. **Option to Transfer.** The offshore partner cannot lock in clients. The clients have the option to bring the operation in-house at any time. The outsourcing contract should detail a well-defined process to ensure

a smooth transition. Typically, the contract includes a clause that says the client has the option to buy the entire operation after a fixed period. A BOT gives the client the ability to realize the benefits of offshoring quickly with limited execution risk while minimizing upfront costs and long-term financial risks.

The BOT model is ideal for a risk-averse company. Building your own subsidiary in a foreign country requires much knowledge and information about the country and culture, as well as the right personnel. If you aren't up to the task of gathering this information, then a BOT solution may be the right answer for your company. The BOT model is usually found in the civil and construction engineering business, especially in the maintenance of highways and airports. Now the BOT model is becoming popular in the offshore outsourcing world.

BOT models tend to build on first-generation ODC models. With the ODC model, the basic framework is in place for the "build" and "operate" parts. With BOT there is an additional option to *transfer* the operations after a certain period. This arrangement provides customers with bottom-line enhancements and fully offloaded costs, risks, and ownership of the new venture. The risk of execution is minimized and the money can be spent on core functions.

Offshore Multisourcing: Hub-and-Spoke Model

Similar to the Chinese proverb that states a clever rabbit will have three openings to its den, many companies will work with multiple offshore vendors to mitigate risk. For instance, a company might establish a shared services center for its finance and accounting operation; it may rely on a third party vendor for its call center operations; and it might have a joint venture with another vendor for its R&D.

Multisourcing is the practice of using multiple offshore business models and suppliers. It helps companies achieve the advantages of a best-of-breed strategy and allows more flexibility. Citibank and American Express have both taken a multisourcing approach that resembles a hub-and-spoke model. They have offshore operations of their own, as well as three or four partners with whom they collaborate. This is an interesting model as the businesses get some of their partners to actually work with them in their own hub centers, train them, and then send them back to the spoke center.

A narrower view of multisourcing is simply doing business with multiple vendors to mitigate risk. Guardian Life Insurance Company embraces a multisourcing approach. The insurer contracts with Patni Computer Systems (Mumbai), NIIT Technologies (New Delhi), and Covansys (Michigan). Instead of awarding one major, long-term contract to a single supplier, Guardian is mitigating risk by working with a consortium of vendors to create a multi-location, distributed delivery model.

The rise of multisource deals could be a sign that companies are taking a more cautious, risk-averse approach to outsourcing. In the case of Guardian and others, multisourcing works because the organization has the internal ability to manage and integrate multiple providers (products, projects, and services) to derive a single solution.

When should organizations choose full-service outsourcing (using one provider) over multisourcing? It depends on the maturity of the organization. Companies that are new to outsourcing tend to multisource until they get comfortable with the whole process. When they renegotiate contracts later, they give more thought to using one provider. Often, to reduce complexity, very large businesses will look for one dominant provider and that provider will then work with a big network of companies.

Whichever business model companies select, whether it's cosourcing, multisourcing, or some unique model that they devise on their own, one thing is certain: The more time they invest upfront in choosing the right business model, the higher their probability of success.

Summary

Internet-enabled offshore outsourcing is enabling firms to become agile. The strategy has matured considerably over the past five years and offers significant advantages to companies that know how to do it right. Companies looking to cut operating costs, focus on core competencies, extend customer service, comply with new regulations, or achieve other goals, now count offshore outsourcing as one organizational strategy they can use to process and absorb change.

Organizational strategies tend to come and go, but offshore outsourcing has staying power. It is a powerful idea, albeit a difficult one to implement, that can produce substantial rewards. Adaptive enterprises such as Dell, IBM, HP and GE have already seized this model to create new value propositions.

Change is constant in the business world. Inflexibility in any form, whether in legacy systems or employee attitudes, is the enemy of adaptive, competitive companies. If agility is the goal, offshore outsourcing is one of the methods organizations can use to attain it.

References

¹ This chapter is based on material from the book "Offshore Outsourcing: Business Models, ROI and Best Practices, written by Marcia Robinson and Ravi Kalakota [Mivar Press, 2005].

7

ADAPTIVE INNOVATION MANAGEMENT



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INTRODUCTION

Growth is the mantra uppermost in the list of strategic objectives of enterprises today; and innovation is widely regarded as the engine that fuels growth. Therefore, effectively managing innovation is vital to achieving sustainable growth. However, in managing innovation, firms routinely get caught off-guard and without proper response mechanisms by what appears to be a suddenly changed environment, such as an economic downturn or the bursting of the Internet bubble. As a consequence, executives often believe that nimble responses to market changes (engendered in decreased cycle time in new product development, for example) are crucial to survival and growth. Krishna Nathan, who heads the 200 engineers in IBM's Zurich-based Research Laboratory, noted that, "There is tremendous pressure on industry to innovate more—and do it more quickly," (Roberts, Sandler, and Kovac, 2004). Echoing this concern, Hewitt Associates report that 65% of CEOs surveyed in 2001 espouse speed and agility in strategy as a high priority.

However, focus on speed and agility alone will likely produce “knee-jerk” reactions in business strategy formulation and implementation. This is especially true in the domain of innovation, where an overbearing focus on speed can result in too many incremental new products that only serve to optimize what is currently offered, rather than seek to open up new markets and new windows of future opportunities (Hamel, 2003). Interestingly, although most executives see innovation as a high strategic priority and R&D spending has been generally increasing, 57% of 250 senior executives surveyed by Boston Consulting report that they are dissatisfied with the return on innovation investments (Roberts, Sandler, and Kovac, 2004). If executives recognize the importance of innovation and spend accordingly, then why is there this high level of dissatisfaction? We suggest that the over-emphasis on speed and agility might be indicative of a deeper problem in innovation management, and recommend that they should not be pursued as a final goal. Rather, speed and agility should be a by-product of a more fundamental strategic process—adaptive innovation management.

Adaptive innovation management is different from traditional innovation management in fundamental ways. We highlight these differences, develop a conceptual framework of adaptive innovation management, and discuss the implications of such a model for business practice. To illustrate the concepts, we draw upon the business-to-business context. Next we illustrate how adaptive innovation management is based on a solid understanding of customer solutions and the differences between agility and adaptivity.

SOLUTIONS-BASED INNOVATION MANAGEMENT: AGILITY VERSUS ADAPTIVITY

Companies are moving beyond integrating processes...and choosing IBM solutions for on demand performance. So they can manage, even capitalize on, continuous change. Cultivate innovation. Model new ways of doing business—fast.

IBM Business Solutions website (<http://www-1.ibm.com/solutions/businesssolutions>)

With much talk today about agile enterprises, as evidenced by the above quote, and the need for swift responses to cascading market changes, managers naturally focus on business models that allow them to generate short-term, rapid adjustments to their market offerings, such as sense-and-respond models. However, our framework suggests that by focusing on swift responses, managers implicitly build into their models a focus on short cycle times, largely ignoring the long-term strategic implications of their actions. This problem is exacerbated by the financial markets’

constant pressure to produce short-term growth. It often leads to less than optimal decision-making, to the extent that, “Speed without clarity and focus simply promotes many dumb decisions fast, while being too agile could take you astray from your core business and mission” (Gandosy, 2003). Hence, firms easily end up being driven by market trends, rather than driving their markets.

We suggest, in contrast, that a long-term view and a business model that explicitly incorporates longer cycle times will allow companies to react more effectively in the short-term in addition to maximizing long-term innovation returns. This view engenders a strong distinction between an *agile* and an *adaptive* organization, and how each approaches innovation management. We define agility as *the ability of firms to react to market changes by adjusting their market offering in the short-run*. On the other hand, adaptivity is *the firm’s ability to understand the reasons for and implications of market changes and to adapt to them by creating an infrastructure and culture for sustained innovation in the long run*. While this distinction is vital, it does not imply that agility and adaptivity are mutually exclusive concepts. Rather, we argue that adaptivity should be given priority over agility, since agility is a built-in characteristic of an adaptive innovation management model.

The question naturally arises as to *how* to sustain innovation in the long run and what type of organizing “tool” to utilize for enabling adaptive innovation. We propose that the appropriate guiding tool in this case is an approach based on customer solutions. Solution-based innovation focuses companies to discover, define, and employ patterns of problems across customers and connect them to a set of fundamental capabilities in the organization. Such solutions-based innovation management requires companies to look past what doesn’t work for customers in their current product or service offering, and focus down-stream on understanding the patterns in what problems customers face. The pay-off from providing solutions, instead of products or services, has been extolled by many as producing customer lock-in, customer loyalty, and increased revenues (Kumar, 2004).

Insert 1: Drive to Solutions

Firms are beginning to recognize the potential of customer solutions, both in the B2C and B2B realm.

- **Progressive Insurance** is testing the possibility of anticipating, identifying, and arranging car repairs for customers, rather than only providing a check to cover repair costs.

- **Vonage** is banking on VOIP technology to offer comprehensive communication solutions by customer groups rather than merely offering VOIP based product offerings.
- **IBM** focuses on providing innovative, integrated IT solutions to its industrial customers instead of providing IT products and services.

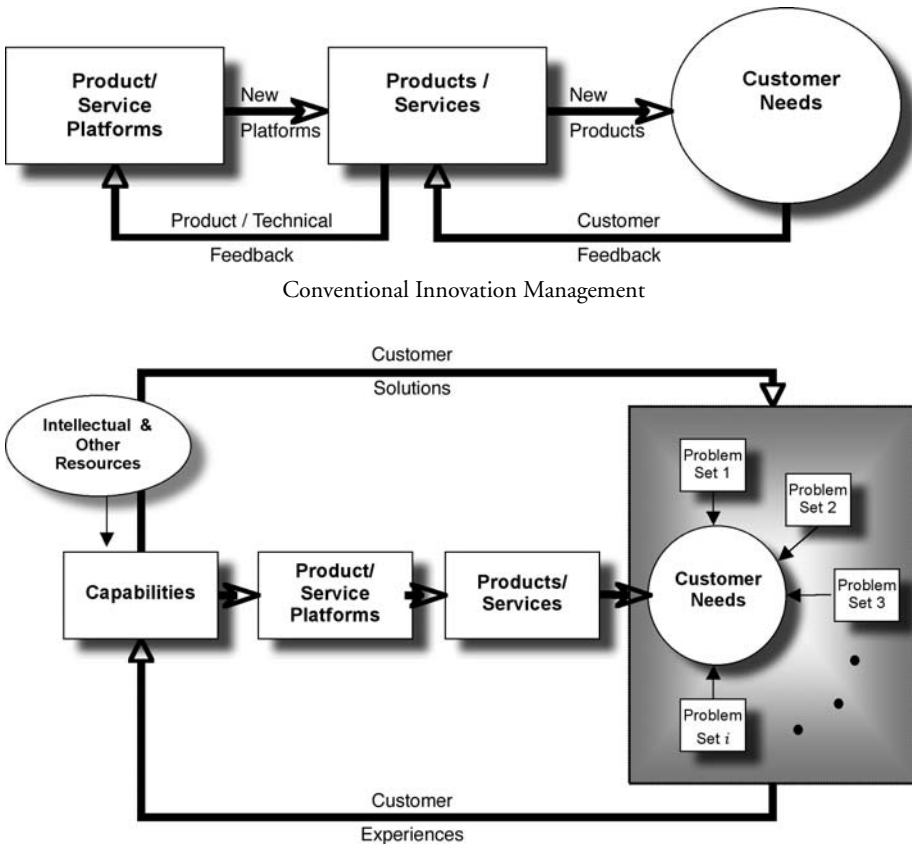


Figure 1. Adaptive Innovation Management

WHAT IS ADAPTIVE INNOVATION MANAGEMENT? THE MODEL

Our framework builds on the fundamental premise that customers are a firm's primary assets. As with any other type of asset, customers are either worthwhile investing in or not, given their respective expected lifetime values. In the business-

to-consumer market, the view of customers as assets (measured via customer equity) has been shown to be useful in making marketing investment decisions. The framework presented here addresses innovation management at a higher organizational level, transcending the usual new product development (NPD) focus existing in much of the innovation management literature. It also builds on the notion of systems thinking and network effects in innovation that emphasize “big picture” views in management models (Chakravorti, 2004).

Figure 1 shows the conventional innovation management model alongside the adaptive innovation management model. It highlights the flow of innovation, which starts with a firm’s set of intellectual assets driving its capabilities, which in turn inform the generation of products and services, usually organized around product/services platforms. While conventional innovation management focuses on maximizing the product/service level and linking it to customers, adaptive innovation management is about the importance of continuous, systematic, and systemic innovation management that links a firm’s intellectual assets and capabilities more closely or directly with the problems faced by customers. We discuss each of the linkages between the model components in more detail below.

MOVING FROM PRODUCT-TO-CUSTOMER TO CAPABILITY-TO-CUSTOMER PROBLEMS LINKING

People assume that innovation equals new products...this narrow view of innovation is very unlikely to create new markets and new wealth.

Gary Hamel (2003), “Innovation as a Deep Capability”

Copious volumes exist on managing innovation by strengthening the link between customer needs and wants and the product or service characteristics. Tools to strengthen this link come in forms of tools such as the voice of the customer, lead user involvement, focus groups, customer surveys, and others. Not surprisingly, efforts have been made not only to understand customers better, but also to do so more quickly. For example, to understand customer preference functions for certain product attributes in a new camera prototype, a company can now utilize a Conjoint Adaptive Ranking Database System in online customer surveys (MIT Sloan School, 2003). With just a few clicks required by target customers, managers can quickly gain valuable insight into how their customers value various attributes and form segments based on this analysis.

While feeding information on customer needs and preferences into new product development is highly valuable for short-term incremental innovation, it rarely affects long-term strategic innovation in companies directly. For such strategic adaptive innovation to happen, two things are needed:

- 1) A focus on understanding the problem sets that customers face (rather than the immediate needs and preferences of customers, and above and beyond customer relationship management), and
- 2) An understanding of the firm's own capabilities that can be used to address customers' problem sets.

Both of these initiatives lead to approaching innovation in terms of customer solutions.

Table 1 highlights the significant differences between conventional and adaptive innovation management and integrates the notion of solution-based innovation. To illustrate the differences in approaches to innovation management, let us examine how Marriott International recently engaged in adaptive innovation management to retain PepsiCo as one of its major business customers. As most companies, PepsiCo has been dealing with cost pressures in a recessive economy and looking to cut costs where possible. With employees traveling often on business, a re-examination of the costs stemming from corporate travel led PepsiCo to conclude that lodging expenses were too high and had to be controlled. As one of its major lodging suppliers, Marriott was a natural candidate for control measures to be taken. What was Marriott to do? Since the problem did not lie in Marriott's quality of services, but rather in their cost. Under the conventional innovation approach, besides cutting their prices, Marriott would be developing new lodging services that would provide cheaper, yet still satisfactory fulfillment of PepsiCo's needs. Hence, the customer need identified (i.e., lower costs) would be the primary focus for developing new services and engaging in innovation.

Rather than accept this customer need for lower costs and engage in the conventional innovation management approach, Marriott dug deeper and asked questions from its major customers. What were the processes like that linked PepsiCo to Marriott? Who made the travel arrangements for PepsiCo? What were their objectives and problems? Hence, Marriott redefined their market to include PepsiCo's supplier and customer network in the domain of corporate travel. The insight gained through this market redefinition? Marriott learned in depth about how travel-related issues affected PepsiCo's performance. To learn about PepsiCo's employees' travel history, costs, and needs, Marriott analyzed data from American Express, the credit card and travel services company that PepsiCo employees used. Marriott also developed a solution for PepsiCo employees to access their corporate intranet from Marriott hotel rooms by partnering with an information technology services firm.

Table 1. Conventional Versus Adaptive Innovation Management

	Conventional Innovation Management	Adaptive Innovation Management
<i>Innovation definition</i>	Identification and development of a new product or service.	Identification and development of new customer solutions.
<i>Market definition</i>	A focus on specific customers or customer segments and their needs. Markets are defined solely by customer groups.	Markets are sets of customer problems that are only identifiable by defining your market as your customers' markets.
<i>Linking to market</i>	Restricted deep linking from customer to product or product platform.	Deep linking of customer and customer problem sets to internal firm capabilities and intellectual resources.
<i>Source of problem set information</i>	Customer feedback.	Customer experiences. Experiences go beyond feedback obtained by asking customers. Experience includes learning while studying the business problems for customers and customer groups.
<i>Innovation cycle and scope</i>	Short-term, tactical, and divisional.	Long-term, strategic, and systematic.
<i>Sources of innovation</i>	Customer needs and firm technologies.	Customer problem sets and firm capabilities and intellectual resources.

As required by the adaptive innovation management model, Marriott worked together with American Express and an information technology services firm to develop innovations in how corporate travel was handled for PepsiCo, helping PepsiCo to more cost effectively and more creatively meet its travel needs. More importantly, however, Marriott drew on its travel industry know-how and capabilities to link to PepsiCo's problem sets and develop a comprehensive solution. Rather than being constrained by its own technologies, Marriott outsourced various components of the customer solution. Marriott leveraged the capability arising from the innovative solution it developed for PepsiCo by building other innovative solutions for problem sets faced by other big corporate customers such as IBM and Siemens. Had Marriott stayed focused on its lodging services as the appropriate level of innovation, a major opportunity to serve its customer would have been missed.

Despite its advantages, why don't companies practice adaptive innovation management? Understanding what stands in the way of adaptive innovation management is as important as understanding how it is practiced. While it is not exhaustive, our discussion below highlights a few important hurdles most companies will face in establishing a deep link between capabilities and their customers' problem sets.

BARRIERS TO DEEP CAPABILITY-TO-CUSTOMER PROBLEMS LINKING

To successfully link between firm capabilities and customers' problem sets as recommended by the model, the relationship between the company and its customers should allow for a deeper investigation of customer problems downstream. This may not be the case in situations where a firm's strategic intent might be directly opposed to that of its customers. For example, when Frito-Lay, Inc. attempted to understand more fully, the market of its potato chips buyer Subway, it ran into several sources of resistance that are common in many supplier-buyer relationships.

- **Trust.** The lack of trust between firms and their customers presents a powerful barrier to achieving full understanding of a customer's situation and the problems they face.
- **Risk of acquisition.** By getting to know more about a customer's business, a company might be perceived by that customer to pose a greater risk of acquisition. For example, Subway might fear that by divulging proprietary information from its customer base to PepsiCo, it could increase the risk of predatory actions by PepsiCo.
- **Adverse decision-making.** Equipped with a better understanding of its customers' markets and problems, buyers might fear that their suppliers will utilize this information to make decisions that will prove detrimental to the buyer's current business model. For example, the strategic intent for Frito-Lay as the seller (i.e., maximize revenue from chips) might be directly opposed to the strategic intent of Subway as the buyer (i.e., maximize sales of non-fried food).
- **Cost of information.** Getting into a customer's shoes requires substantial time and resources, which might be seen as being more valuable if deployed elsewhere. For example, PepsiCo might pay Subway \$1 million/

quarter for sharing their customer surveys. Not surprisingly, rival Coca Cola is also a strong believer in “knowing your customers’ consumers” and has been implementing this belief.

- **Divisional, departmental, or functional silos.** As a company gets bigger, its intellectual assets and capabilities get more distanced and even divorced from one another and from customer problem sets both within and across business groups or markets. This prevents the intellectual assets from being deployed directly to come up with innovative solutions for larger customer problem sets, leading to missed innovation opportunities. For example, Hewlett Packard Labs is a group within Hewlett Packard that has several talented scientists and engineers who work on improving the design and delivery of offerings to its customer groups. These scientists and engineers act as internal consultants and interact mainly with divisional managers, rarely working directly with customers on their problem sets. Such a setup may allow the firm to be agile, but not adaptive with respect to innovation management. In contrast, Procter & Gamble (P&G) follows what they call “360-degree innovation,” bringing together functional areas for close collaboration and intently moving technologies and ideas across their various business units to maximize synergies and recognize potential customer solutions (At P&G, It’s 360-Degree Innovation, 2004).

In sum, a close relationship with customers is accepted as key in today’s dynamic environment. However, our exposition of a few barriers to deep linking to customers illustrate that companies cannot always rely on cooperation from their buyers to understand them better. To gain such cooperation from supply chain and network members, companies must demonstrate value to each of the network members. Alternative methods for developing a deep understanding of a firm’s customer problem sets need to be explored.

HOW CAN FIRMS MOVE FROM CONVENTIONAL TO ADAPTIVE INNOVATION MANAGEMENT?

To surmount the external barriers to deep linking a firm’s capabilities to their customers problem sets, firms should follow a six-step process of adaptive innovation management. This process leads companies from assessing their internal strengths and capabilities to measure the effectiveness of addressing

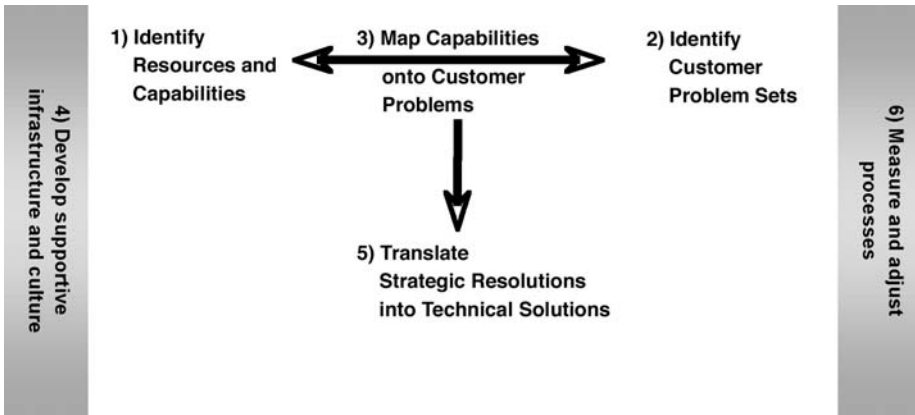


Figure 2. Steps in Implementing Adaptive Innovation Management

customer problem sets via solutions. Figure 2 illustrates the six steps necessary for successfully implementing an adaptive innovation management model. We explain each of the steps in more detail below.

1. *Identify internal capabilities.*

To identify an organization's capabilities, corporate executives must work closely with divisional managers. Often, successfully identifying strengths and what the company does well is hampered by an unnecessarily narrow view of capabilities. For example, companies easily fall into the trap of identifying technologies as capabilities. Kimberly-Clark sees as one of its major capabilities its know-how in non-woven fabrics. Such a technology allows it to serve diverse customer needs, from diapers to feminine hygiene. However, this focus can lead to innovation myopia and leaves out the most important underlying capability of intellectual capital and other organizational resources that drive capabilities. For example, Kimberly-Clark has several engineers and scientists with expertise in fluid mechanics and chemical engineering. Linking their expertise to customer problem sets could provide the source of continuing new innovations. Hence, managers must take a deeper view of capabilities on which to build. Boeing, for example, realized that one of its main capabilities was grounded in finance and investment management, not in manufacturing. Boeing was able to deeply link this capability and its underlying sources to the needs of ATA, a potential customer. The result? Boeing was able to close a \$2.9 billion sales contract with ATA, which would not have been possible otherwise, according to ATA president and CEO John P. Tague (Proctor, 2000).

2. *Identify customer problem sets.*

Apart from small and medium-sized companies, bigger corporations are particularly challenged in their efforts to scan across customer groups and segments to uncover patterns of problem sets. Particularly important is a focus on what is going on in your customers' markets and how their suppliers and customers are changing, thereby identifying new problems that create opportunities for innovative customer solutions. Marriott's comprehensive study of PepsiCo's relationship with American Express led to a deep understanding of not just PepsiCo's problems, but also of other customers with similar problems. Too often, customer needs and requirements are viewed in isolation from the customer's own network of suppliers, buyers, and other channel members. A comprehensive view and understanding of all involved is needed for successful adaptive innovation management.

3. *Map capabilities and intellectual resources to customer problem sets.*

Too many managers are caught up in providing the correctly configured product or service to their customers. Fueled by the oft-repeated advice of continuously improving product quality, managers spend the bulk of their time in activities than promote product fine-tuning. When developing an adaptive innovation management process, do not think of specific offerings (i.e., no specific products or services), but focus on strategic solutions, linking the cause of customer problem sets to a resolution of these problems (not to a solution, which represents specific products or services). This needs to be done across divisions.

4. *Develop a supportive infrastructure and culture.*

How do you move from identifying the right capabilities and intellectual resources to deploying them in the form of the right set customer solutions? One way to achieve this is to ensure that your value systems are supportive of adaptive innovation management. When Whirlpool decided to make innovation systemic and a priority for everybody in the organization, executives recognized that a supportive culture was imperative for the change to take place in reality, not only on paper. The result was a pervasive change in values and behavior throughout the organization's divisions and levels. Because adaptive innovation management calls for deep linking capabilities and intellectual resources with customer's problem sets, it is all the more imperative that values and incentives are aligned to promote such a culture and infrastructure.

5. *Link strategic (resolution) to technical (solution) spaces.*

Once capabilities and customer problem sets have been identified and a supportive culture developed, implementation of innovative customer solutions become the next step on which to focus. Only now should strategic spaces (i.e., resolutions to customer problems) be linked to technical spaces (i.e., solutions embodied in products or services). Just as the front end of product innovation represents the conceptual idea of some solution, which is translated in later stages into a combination of technical features and attributes that make up the actual product or service, so strategic resolutions need to be translated into technical solutions. In New Product Development (NPD) this translation happens via tools such as Quality Function Deployment (QFD) and the House of Quality. In adaptive innovation management, this process occurs at the organizational capabilities and intellectual resources, rather than at the product level.

6. *Measure results and adjust processes.*

As with any new process, measurement is critical for assessing how successfully change has been implemented. In general, two sets of measures need to be applied. First, have capabilities and intellectual resources been linked successfully to customer problem sets? Second, have strategic resolutions been linked successfully to technical solutions? The first set of measures should address the conceptual and strategic aspects of identifying capabilities and customer problems. The second set of measures assesses the implementation of the identified customer solutions and how successfully they have been deployed into the market. An innovation management scorecard will be a definite plus. This scorecard would track periodic identification of customer problem sets and corresponding innovations and a stock of utilization of the firm's intellectual assets. An example of such a scorecard is shown in Figure 3.

IMPLICATIONS OF ADAPTIVE INNOVATION MANAGEMENT

Except for crisis situations, significant and large-scale organizational change toward a determined direction is extremely difficult and very rare. Even rarer seems to be the organization that is comfortable with constant change. Yet that is the essence of an adaptive organization operating on a rugged landscape. (Fulmer, 2000, p. 109)

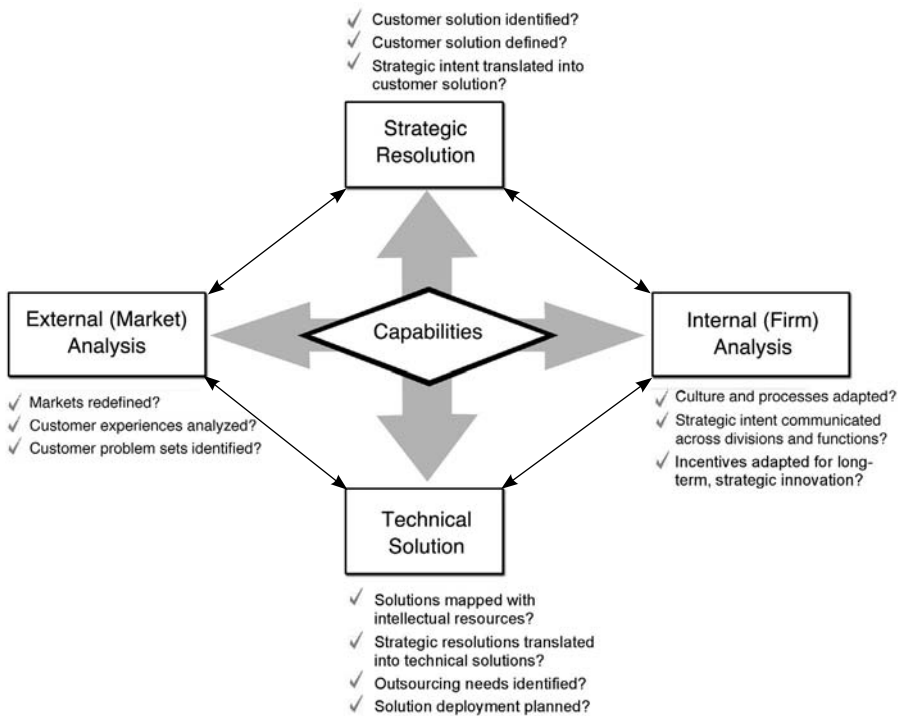


Figure 3. Adaptive Innovation Management Scorecard

The ideal solutions provider has an organization that is people-, knowledge-, and process-intensive but asset-light. Its focus is on knowledge—learning about customers, collaborative learning with partners, and learning to leverage network partners' resources and competences. (Kumar, 2004, p. 86)

How does truly adaptive innovation management work in companies? What can managers expect, and what do they need to look out for? Adaptive innovation management requires both top-down and bottom-up implementation and the driving of a new adaptive business model. Vision and values need to be dispersed throughout the company by top management and tangible expressions of the new model (even something as simple as posters; shared emails; etc.) that embody the new innovation management approach and reflect actionable enacted values. In addition, empowering middle management to implement vision can be achieved via restructured communications, incentive structure, and aligned metrics. Case in point is Whirlpool, where innovation was transformed from being what a few top managers did to innovation being part and parcel of every employee's job description. The drive to embed innovation as a core competency throughout the organization and at all levels was defined by CEO David Whitwam in 1999 as the vision "Innovation from Everyone and Everywhere" (Snyder and Duarte, 2003).

Adaptive innovation management goes beyond embedding innovation at all levels by making deep linking a cornerstone of the firm's business philosophy. The importance of shared value systems in organizations is well documented, and it's especially critical when pervasive changes in the culture and strategic direction of a firm is made. Just as customers encountering a new product are trying to fit it into their existing repertoire of mental models, we argue that managers and companies try to force changes in the environment into existing response templates, and a new innovation management model requires adjusting such mental and response templates. Even more important, companies need flexible and adaptive (mental) models that are embodied in their business models. This can be achieved by building in explicit parameters of change into the innovation management model forcing constant reinterpretation and recalibration of the model.

Another example of systems-wide innovation and the drive towards harnessing cross-divisional synergies (i.e., capabilities) can be found in Siemens Medical Solutions. CEO Erich Reinhardt spells out the imperative of staying close to the market while coordinating innovation efforts across divisions to maximize synergies:

We work with each division to define clear goals and objectives, but it is their responsibility to meet these goals. They are the worldwide entrepreneurs. One especially important skill that entrepreneurs in a large organization must have is the ability to recognize and efficiently use internal cross-division synergies.

*Dr. Erich Reinhardt, CEO and president of Siemens Medical Solutions
and a member of the managing board of Siemens AG*

In addition to the systemic nature of adaptive innovation management, a focus on strategic innovation, capabilities, and customer solutions will result in more selective investments and fewer "knee-jerk" innovations that are not strategically linked to a long-term vision/mission. The focus on capabilities and solutions forces management to constantly re-evaluate and redefine markets and focus their efforts on integrated streams of innovation, rather than on *component-based* product-driven innovation. Cardinal Health, Inc., for example, demonstrates this strategic, adaptive, innovation management by addressing customers' problem sets via comprehensive solutions. Its drug wholesaling business has been developed to control the distribution of drugs "all the way through hospitals to the patient's bedside, with automated systems that can offer pharmacies and hospitals up-to-the-minute data about where a drug is located or which nurse has it" (Crockett,

2003). This addresses hospitals' concerns regarding errors stemming from human data entry. Furthermore, Cardinal links its innovation efforts in automation by connecting its distribution business with its non-distribution division, exemplifying capability-driven innovation management across customer problem sets and divisions. For example, in 1996 Cardinal acquired Pyxis, the maker of a smart machine that monitors the drug requirements of patients and helps nurses in administering them.

CONCLUSION

The increasingly dynamic marketplace with all its disruptive economic, technological, or sociopolitical shifts calls for organizations to have adaptive innovation management and business models in place. Firms are caught in a conventional innovation management process that produces a distinct disconnect between innovation management (which takes the form of NPD or project management) and the strategic vision of the firm (which guides overall managerial action). While narrowly defining one's business (narrow product-benefit definition) results in marketing myopia, solution-based, adaptive, innovation management can connect managerial activities within a firm via strategic resolution spaces, and thus ensure synergies, deployment of core capabilities and intellectual assets, and closeness to market across divisions.

In this chapter, we have identified that managers who primarily focus on increasing the speed of their innovation processes lose sight of the long-term strategic implications of their innovation decisions. In effect, concentrating on agility in innovation produces improvements in the status quo (i.e., improvements in the current product offering within current markets). Moreover, agility demands an understanding of customer demands and reliance on customer feedback. Since this is advocated by market orientation, how can that be detrimental to successful innovation? Ironically, simple customer feedback masks the underlying customer problem sets—and only a deep understanding of customer problem sets allow managers to develop innovative customer solutions that break out of standing customer need and product definitions. Hence, managers must recognize how imperative a deep linking to customers' markets and problem sets are.

In linking to customer problem sets, the scope of innovation must also be redefined. Rather than working on developing new products or services or product/service platforms, companies must understand and link their internal capabilities to customer problem sets. This requires innovation at an organizational

level with a strategic, systematic, and systemic focus. Companies that implement such an adaptive innovation management model will have to ensure a supportive infrastructure and culture, but can look forward to significant returns to their innovation investment. Case in point is P&G, where—as CTO Gilbert Lloyd recently noted—a new innovation management model that identifies and connects capabilities, functions, and divisions, and moves technology and ideas around in the company, produced a significant increase in innovation productivity—with a 20% reduction in R&D investment!

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8

THE DNA OF ORGANIZATIONAL AGILITY



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UNCERTAINTY IS THE MOTHER OF INVENTION—AND AGILITY

What is it about certain words, the word agility, for example?

After a period of eclipse, agility is currently more than a hot word; it's a bona fide hot topic, a favorite of the press, the pundits, the analysts, and vendors. A question is, why now, or why again? The answer is as simple as its implications are profound; what's driving this hot topic is a cold reality—the inexorable marketplace uncertainty we all face.

Consider: In a recent survey (Global Future Forum, 2002) of CXOs (senior corporate executives that have “chief” in their title) and senior executives, 40 percent reported that in the past year their organization had experienced *radical change*. The thing is, the uncertainty that drives radical change is now the *only* certainty of our competitive life. But just how prepared is business to deal with it?

Not very well prepared at all. In the same survey, 57 percent of the respondents rated their organization as “ineffective in managing the varying scopes of change.” This helps explain the critical need for agility. We all know that we face a significant amount of uncertainty; we also all know that such uncertainty creates fast moving business opportunities—for those able to exploit them. As we see it, this means building the capabilities and mechanisms needed to exploit those fast moving business opportunities—indeed, the very opportunities that uncertainty creates. To put it another way, uncertainty is the mother of invention, just as agility is the ability to mobilize your capabilities and resources to take advantage of those opportunities, and to do so before fast-following competitors can get into the act, copying the model, and bleeding off its value.

There has been much written on organizational agility—on what an agile company *looks like*, on the leadership needed to champion agile capabilities throughout the organization, and on sets of *stuff* to do to become more agile. As we’ll briefly discuss below, there are multiple and specific challenges to being agile, challenges we face everyday. Yet, what we want to explore in this article is a two-sided question: 1) is there a *root cause* that impedes organizational agility, and 2) is there a corresponding DNA for organizational agility. Such DNA, if it exists, can be excavated to expose another way of making sense of the challenges we face and from that being able to *take action* more effectively to become more agile.

On that note, let’s begin with a simple working definition:

Organizational agility is the capability to respond to new business demands and opportunities effectively and efficiently, rapidly shifting and aligning business assets to beat the competition to market.

And just how important is agility to executives? Very important according to 64 percent of the C-level executives from 250 mid-to-large size companies in the United States and the European Union, who said that “agile organizations that can react quickly to changing business models, technologies, and processes will outperform companies that focus on cost efficiencies.” (Unisys Corporation, 2003) Ponder that for a moment. In the calculus of uncertainty, agility is beginning to dethrone cost. Faced with this necessity, many executives perceive a new challenge: how to transform their company to achieve agility and all the success that goes with it. Such capability depends upon being able to execute quickly and effectively. So far so good—easily well accepted, and even more easily said. The difficulty, as we all know, lies in actually *being* agile. What *is* it about an organization that makes agility so difficult to achieve? And what is common to these difficulties? Let’s see.

CORE CHALLENGES TO ORGANIZATIONAL AGILITY

Four specific challenges we all face everyday impede organizational agility.

First, how do you get your business processes to be sufficiently responsive to changing market conditions?

Whether those changes are regulatory-driven or a result of disruptive technologies or competitor moves, this particular challenge manifests itself in complaints we all hear and live through about how to get new products or services out the door faster. Or, from a public sector perspective, how to be more responsive to ever changing legislative demands for new services, much less convert an agency or department into a more “constituent-driven” organization.

Second, how do you integrate existing with emerging technology applications?

We know the statistics only too well. Up to 70% of the IT budget spent is on maintenance and redevelopment rather than new application development, and 60-80% of application functionality is redundant leading to significant drag on cost levels. These and other statistics merely mask the real issue that a new set of technical skills is required to complement the ones we already have, given the never-ending introductions of new technologies and tool-suites. Yet the preponderance of efforts remains tied to ensuring that the heritage or legacy applications are maintained, and for good reason—they work! This tension *between what we have and what we need to incorporate* is even further exacerbated—whether by extensive consolidation or acquisition of companies into other companies, or the result of kicking off multiple projects to meet multiple objectives multiple times over the years. This leads to what? Extraordinarily complex and different technical environments compounding the difficulty of getting different systems to talk with each other, much less figuring out how to evolve the skill-sets of your people, and even much less figuring out effectively how to integrate existing with emerging technologies. And on and on we go.

These first two problems are well known, having been a non-stop challenge for many of us for the past thirty years. The following two are increasingly becoming critical.

Third, how do you identify and leverage your intellectual assets?

Often, the topic of intellectual assets slides quickly into squishy discussions of knowledge management and other consultant- or marketing-driven terms that lead more to brain lock than effective activity. Let’s avoid this by articulating some specific business challenges and opportunities of, and from, this topic.

The CIO of the Retail Banking Business Unit of a major global bank has articulated *training* as one of his most strategic initiatives. The reasons are a combination of ongoing economic and competitive pressures on margins, as well as the fact that the momentum for outsourcing has resulted in significant *right-sizing* of the retail banking employee base. The concern he articulated was that much of the **organizational wisdom** of how to run and maintain, much less develop and deploy specific retail banking applications was either “forced out or walked out the door.” This organizational wisdom was some of the knowledge and know-how critical to keeping the business running. Mark Foreman, former CIO of the federal government, decried the demographic implications of 42% of state and local employees who are scheduled to retire within the next five years. What will be the implications on systems maintained and developed, he queried? What will be the implications on the quality of constituent services that these systems enable as these people retire? As Mark pointed out, and a surprise to no one, many of these systems and applications are undocumented, held together merely by the **tacit knowledge**—the knowledge in the heads of the people who built them and maintained them over the years. At a late fall 2003 conference in Europe, the vice-chairman of one of Europe’s and Latin America’s premiere financial institutions, articulated concerns about the “demographic transformation” of Europe and Latin America and its implication on maintaining a leadership position. As the graying (and increasingly, retiring) workforce in Europe meets the labor migration from North Africa and Eastern Europe into Western Europe—and these meet both the greening of Latin America and its explosive entrance into the workforce—what will be the implications on maintaining a competitive position and effective operations? So much of what people know will be lost as they retire; yet the demands for new products and services will explode in urgency and need. Who will be there to train the new workforce? How will we minimize the impact of the *brain drain* as the existing workforce moves on?

There are two specific parts to this “intellectual asset” issue. The first is recognizing the role of *tacit* knowledge as one of the key intellectual assets of your every-day activities (more on this later). As we all know, knowledge is embedded into systems, applications, business processes, and norms of behaviors that together form the organizational glue that underlies what you do on a day-to-day basis. The technical term for this is the **instantiation** of knowledge into your business practices ranging from hard assets (systems, applications, and documented business processes) to soft assets (norms, values, work-arounds, and undocumented business processes). The second part is to figure out the half-life of these assets, how valuable they are, and for how long. Which of these assets add competitive advantage to you and in what areas? How long will those advantages last and what do you do with assets that no longer enhance your competitive positioning?

Geoffrey Moore, the best selling author of *Crossing the Chasm* and *Living on the Fault Line*, approaches the half-life question of intellectual assets in terms of *core* and *context*. For Moore, what is **core** to your business are those activities and instantiated assets that add shareholder value and add differentiated value, while **context** activities are things that have to get done but add no direct value to your competitive position. The challenge, as Moore summarizes it, is to continually evaluate your core and focus on it, and figure out what to do with your context—whether to merely stop, reengineer, or outsource it. For a quick example, ING Insurance, one of the world's largest and most profitable insurance companies, has been involved recently in developing a new policy administration system. Throughout the project, they have been as aggressively focused on understanding what their intellectual assets were as the specific functionality that had to be built. For each process and application, they have been asking what type of competitive value each asset provides, for how long, and what to do about it, recognizing that answers to these questions determines if and how to exploit the asset.

Fourth, how do you mobilize your different teams with their different perspectives and priorities?

We all know and live the frustrations of conflicting organizational activities, silos, redundant processes, and confusing if not complicated governance policies. The common cry for the need to align metrics is stifled by the operational complexity of how to do so given fundamental differences of priorities and focuses. George Colony, CEO of Forrester Research, an industry research group, humorously characterizes an organization as consisting of three types of people: T-Shirts, Turtlenecks, and Suits. T-Shirts are your operations people, Turtlenecks the marketing teams, and Suits the management folks. Even though they may all acknowledge the same set of organizational objectives and even high-level business metrics, how they understand them and how each group's orientation to realizing them are so vastly different, it makes them irreconcilable. It is, consequently, no wonder that organizations so seldom experience what we call the **executional consistency** necessary between strategy and operations; the differences in approach, in understanding, in orientation, and in perspectives are so different that it makes any type of executional consistency a pleasant surprise (when it happens) rather than an operational norm.

ROOT CAUSES

We're sure that we can all nod our heads at one if not all of these challenges to organizational agility. They create tremendous amounts of frustration and costs,

both personal and organizational. So why are these challenges so hard to address? These problems have been around for years. Is there really anything today that is significantly different from yesterday to allow us to take on these challenges differently? Is there a common challenge or a root cause underlying them that, if redressed, could begin to stem the frustrations they engender and thus enhance organizational agility? On the surface, their different focuses seem so diffused as to frustrate any attempts to find common ground among them. But can we not find common ground upon which to make sense and take action more effectively regarding organizational agility? The answer to these questions is the same: yes.

Underlying each of these challenges—the common strand to them all—is what we call a *semantic disconnect* (Welborn and Kasten, 2003). Semantics is defined as the sharing of meanings among different people. Thus, a **semantic disconnect** occurs when different people take away different understandings of what has to get done to reach an objective. Each of the agility challenges listed above rests upon this semantic disconnect. Let's take a simple example—one that we've all likely experienced time and time again—that of frustrations with regards to specifying business requirements for a new application to be built. We describe this process between the business operations person (John) and the technology development person (Mary) in the form of an abstracted but way-too-often conducted dialogue.

- John (after signing onto to the new credit card assessment application that Mary has just supplied him to evaluate): “But, this isn't what I asked for.”
- Mary (taken aback): “Sure it is. We've been working on the requirements together for months, and I've been providing you status updates and even access to test out certain features for four weeks now.”
- John (acknowledging the comment): “That's true, but this isn't what we need here. It doesn't refresh the credit configuration calculator to account for changes in the interest rates.”
- Mary (a bit frustrated): “But John, we clearly worked through pages and pages of requirements. You even signed off on them, again and again. See?” she says as she points to the requirement documents with John's signature on them. “Here is your signature.”
- John (equally frustrated, voice rising): “Well, that may be what I said, but that's not what I meant or what we need!”

Ever had one of these conversations? Or asked differently, ever *not* had one of these conversations? Who is at fault? Is anyone? We would say that John and Mary—assuming that each is a diligent professional—experienced a semantic

disconnect, probably due to the fact that business people and technical people have different vocabularies, so communication between them is problematic.

Such semantic disconnects occur again and again in organizations all over the world, leading to the rework, additional costs, finger pointing, personal and personnel frustrations, budget blowouts, exacerbated organizational silos, and (need we add) project delays that sap the organization's ability to mobilize in response to a need for change. Each of these contributes to all four of the agility challenges we listed earlier. It is consequently no surprise that there is a lack of executional consistency. How can there be if the fundamental semantics of how to express and execute across differences cannot be overcome? Thus, the issue of semantics is not merely one of *making sense*; it is tightly coupled with the challenge of *taking action*. It is consequently no surprise that organizational agility remains such an organizational bugbear and a key focus of organizations.

If semantic disconnect is the root cause hindering organizational agility, the corollary question becomes *how* to semantically reconnect. Stated more formally, ***the critical requirement for organizational agility is to drive executional consistency through overcoming the semantic disconnects that permeate many of your organizational activities.*** This entails having the tools and methods to create common expressions to drive the executional consistency needed. This is not an issue of changing your languages, of aligning your metrics, of changing your governance processes, of communicating more, and more. It is fundamentally about creating shared and shareable capabilities to drive consistent execution. It is fundamentally about creating the capabilities to ensure that the decisions taking place at the top of an organization or its **strategy** can be and are consistently executed down and throughout an organization—through its business processes, applications, and infrastructure.

Ok, you say. Nice vision. Or some, at this point, might say, *huh?* Such a claim has been a holy grail for years. So, what's different now, and how do we make it happen? Let's answer those questions in two parts: first, how to think about it, and second, how to instantiate it into your business process.

THE DNA OF ORGANIZATIONAL AGILITY— ANSWERING THE QUESTION OF THE “HOW”

So far, we've described core challenges to organizational agility, described key requirements for it, provided some quick examples, and stated the underlying

DNA *for* organizational agility. But we have yet to describe *how* to look for that DNA and how to manipulate it for your purposes.

As we've seen, agility essentially entails two things. First, it requires that many people must rapidly *make sense* of an opportunity. Second, they must effectively *take action* by mobilizing a range of people and resources and executing consistently. Let's take a deeper look at the underlying conditions for this to happen.

A new business opportunity emerges when someone has an idea or sees an opportunity that others have not seen, and therein lies the rub. The underlying value proposition is novel, relatively unexploited or difficult to replicate because, more than likely, it resides solely in its creator's head. Taking effective and scalable action depends upon taking this **tacit idea** (the knowledge in someone's head) and mobilizing that idea so others—and ideally, many others—can understand, then execute that insight on a large scale.

This ability to take action on a large scale demands an ability to **codify** the tacit idea, in other words, to turn it into an explicit form that then can be communicated, understood, and used by many others. Imagine it as a recipe. Without the recipe, you have the boutique restaurant—the master chef with the master's touch creating masterpieces for a handful of diners. With the recipe, on the other hand, you can have the global franchise. That's scale, and the secret sauce is codification, the recipe to everything from potato chips to microchips. The difference in an uncertain world is how fast the recipe changes—and *must* change—before competitors can break the recipe or crack the code, diluting markets and eroding margins.

Agility speaks to this process of codifying and scaling tacit knowledge into the well-defined business processes, technology enablers, and other assets that others can use consistently, effectively, and cost-effectively. **Tacit knowledge** (*all those intangibles of what we know and experience*) itself has potentially high value and high margin, but, being inaccessible, is not scalable. We can break through the inherent scaling limits of tacit knowledge by codifying that knowledge into the processes, frameworks, and standards where the power of scaling can kick in. How well a company does this, in our view, is the true determinant of how agile it is. Stated differently, this *process* of codification comprises the underlying DNA for organizational agility. We've reduced it to a simple agility-mantra: *the more codified, the more executable; the more executable, the more scalable; the more scalable, the more agile; and the more agile, the more competitive.* (See *Understanding Competition*.)

Understanding Competition

Competition results from different companies attempting to exploit a sufficiently attractive market opportunity. Initial market opportunities are usually high-margin and/or high-revenue opportunities, the results of their underlying value propositions being novel, consequently relatively unexploited or difficult to replicate, and largely embedded in the heads of relatively few people. Over time, these margins tend to get arbitrated away or shrunk as new competitors, recognizing the potential of those market opportunities, enter the competitive fray. What shrinks those margins are processes, technologies and other activities that bring down their operational costs and allows them to become more scalable, hence executable by many. The means of driving such scalable activities is the enabling codification of those activities – of the tacit knowledge, the knowledge in the heads of few - into frameworks, into standards, into executable and repeatable activities.

What is it about this process, this dynamic, that makes it so important, and so essential to explain competitive pressures? Tacit knowledge has potentially high value and high margin. Yet it is not scalable. It resides in a few heads and is subject to multiple interpretations hence fragmented uses and possible conflicting standards. Tacit knowledge, then, by design and structure has inherent scaling limits. Let's think about this through an example. Many of us have been involved or subjected to corporate strategy projects or proclamations. Yet what many of us, again, have come away with from such involvement is the recognition that strategy is only conceptually clean and analytically pure, but operationally useless. Why? Because there is frequently a significant "execution" gap between strategic proclamation and operational reality, a result often due to the development of the strategy by a few without thinking through of how to scale the shared assumptions, expectations and objectives to the many of us who need to execute on that strategy. Yet, it is certainly understandable why there is such difficulty of doing so. Strategy formulation is inherently a messy process, heavily reliant on tacit knowledge from a few people with their own set of assumptions, beliefs, and perspectives attempting to create some shared sets of overall objectives. Yet even upon some agreement of shared objectives and strategic formulation, there are no consistent sets of standards, frameworks or consistent process to drive strategic thinking into everyday operational execution.

What do we mean by codification and how do we know it when we see it? One tool we use is called the Semantic Stack, a simple way of thinking about the degree of codification. (See *Understanding Codification*.)

Understanding Codification

Before describing the semantic stack, let's step back one more time and explore the question, what do we mean by codification and how do you know it when you see it?

At some point in the distant past, people began expressing themselves using words, first spoken and then written. From these words emerged common ways of speaking, shared communications, common viewpoints and shared culture, and the ability to mobilize people to effective action. What made and makes effective actions are the shared understanding of what is expected, of what to do, of how to do it, and of measuring and realizing the value of those actions. This sharing of meaning and hence of scalable action derives from having shared "semantics". Why is this important? *Because shared knowledge and understanding becomes more scalable and cheaper when knowledge is codified, so the degree of codification in any area is a critical measure of organizational agility.* Now, back to the Semantic Stack.

THE SEMANTIC STACK FIGURE

The **Semantic Stack** is depicted as a simple grid. The horizontal dimension of the stack depicts the degree to which organizational knowledge (of best practices, new business ideas, etc.) is codified. And notice: *as you move to the right along the stack, the greater the codification, hence the more scalable and executable the activity.* The vertical dimension of the stack refers to different types of organizational activities. The shaded areas roughly depict the current state to which the particular type of organizational activity has been codified. For example, industry standards bodies, vendors, and the majority of global businesses have fully agreed to the standards and *shared semantics* underlying infrastructural connectivity around TCP/IP to enable products and services to be fully automated or executed. The once tacit knowledge embedded in TCP/IP design has been fully embedded into TCP/IP-enabled products and services allowing a degree of automation and automatic execution that far exceeds any other set of organizational activity in this framework. As we can quickly see, the higher up the stack, the lower the degree of codification and, therefore, the challenge for being able to scale and execute quickly and effectively around that set of activities. As we will see, in terms of the stack, increasing organizational agility can be described as moving from *tacit* to *executable* and of doing so across more and more of the activities. This process is called **walking up and across the stack**. (See *About the Semantic Stack*.)

As we see from the simple TCP/IP example, shared knowledge and understanding becomes more scalable and cheaper when the knowledge is codified. *Therefore, given that shared knowledge and understanding becomes more scalable and cheaper when the knowledge is cheaper, the degree of codification in any*

About The Semantic Stack

There are enormous implications of the Semantic Stack, in terms of competitive positioning, assessing specific business opportunities as a result, and its implications on people, process, and technology. We explore the stack, its underlying logic, and specific business implications in detail in our book, *The Jericho Principle: How Companies Use Strategic Collaboration to Find New Sources of Value* (NY: John Wiley & Sons, 2003).

As we look at the stack, we should keep in mind the spirit in which it is offered. While we can change the *labels* along the left, the key issue is that this serves as a simple tool to make explicit the critical role of codifying tacit knowledge as well as the competitive pressure to inexorably move towards greater levels of codification with profound implications on who your competitors are, the source of the competition, and the implications on organizational agility.

of these areas is an important measure of potential organizational agility. (See About the Semantic Stack.)

So what? There are two things that you can take from the semantic stack. The first is that the stack acts as a mirror that you can hold up to your company and see what is reflected back. By showing the degree of codification in a particular layer, the stack gives you a means—at a high level but provocative way—to see how your company measures up. Second, the stack shows how the intellectual assets in your company are stratified, from abstract things like “business objectives” to concrete things like “connectivity” and “platforms.” This is important because agility comes from codification both within a layer and from being able to execute consistently across layers as well. To make this point, let’s focus on two of the layers of the stack, one, the Applications Layer and two, the Business Processes Layer, and discuss codification within each layer, then codification between the two layers. This will be followed by the next section on 3D Business Blueprinting in which we will discuss the notion of traceability as a particular way to create codification across the layers.

The **Applications Layer** is where automation meets the people in your company. Today that generally means computer applications, but it can also mean physical machinery like a check sorting machine. In the applications layer, referring now to computer applications, *codification* translates to, among other things, clearly delineated application functionality and clearly specified interfaces between applications. Taking them one at a time:

- **Application functionality:** Applications exist to support business processes, and for most of the time that people have been writing computer applications, they have focused on creating automation to

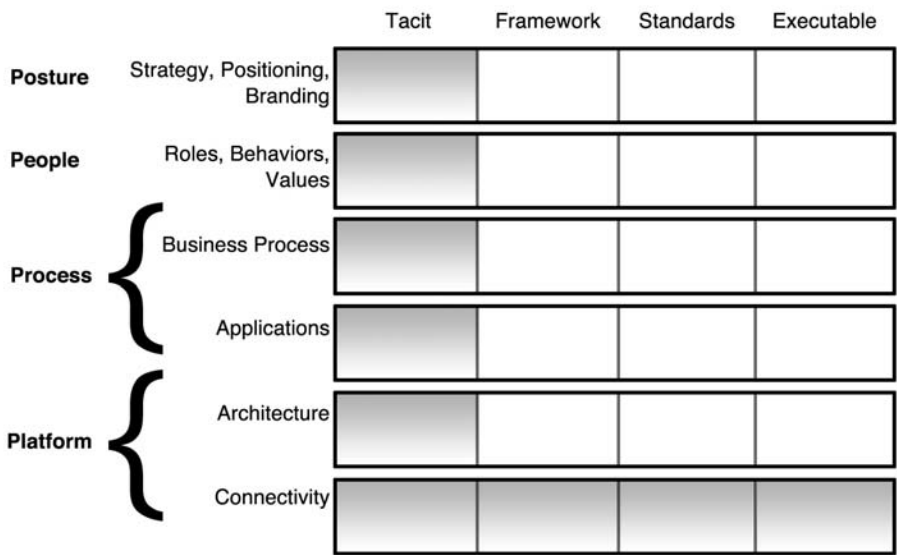


Figure 1. Semantic Stack

support one or a number of linked business processes. The problem with that approach is that, in rapidly changing times, business processes need to change much faster than applications can be re-engineered. For example, a new wireless telephone carrier can offer calling plans with billing in one-second increments with rollover. The legacy carriers have been challenged to respond rapidly to this competition partly because their billing applications have a legacy back to times when the telephone industry was stable (and people were billed “for the first three minutes”), and the billing applications did more than just billing for phone use—they included functionality for marketing, fraud detection, tariffs, and many things not strictly related to billing.

More recently, application development disciplines such as Object Oriented Design (OOD) have evolved that allow software engineers to understand problems in terms of clearly partitioned functionality. Applications created using these new engineering principles comprise discrete components, each of which clearly implements self-contained functionality that can be modified with minimal impact on other components. Thus, a well-designed biller created using OOD principles can be easily modified to accommodate billing increments other than “the first three minutes.” OOD and related disciplines provide codification that creates the conditions for agility in applications.

- Interfaces: Applications need to communicate with other applications, both within an organization and among organizations. Again using the telephone company example, to open a new customer account the biller communicates with the customer care applications, with the provisioning applications that turn on new service, and with the billers of other telephone carriers. For applications to interface, there needs to be an open channel and a clear language. *Codification in interfaces means widespread agreement on the communications channel and on the language “spoken” across that channel.* Historically, interfaces have been created one application at a time with slight regard for other application interfaces and thus, little standardization.

Over the past five years, however, the Internet and its related technologies have emerged as the clear channel for communications between applications and organizations. Along with this, “languages” such as HyperText Markup Language (HTML) and eXtensible Markup Language (XML) have emerged as standard languages for application-to-application communications. Specific vocabularies of XML such as e-business XML (EBXML) and security assertion markup language (SAML) provide widely understood and accepted means for communicating among applications. Finally, Web Services, an emerging standard for application-to-application interaction across the Internet, provides a standard way for applications to advertise and fund functionality, connect, and communicate via XML. This codification in interfaces creates the conditions for agility since applications (supporting business function) can more easily and robustly communicate with other applications, meaning that as business functions change, applications can be rapidly deployed to support the change.

The Business Processes Layer is where the company’s production happens and where the company interfaces with the outside world, e.g., its customers and its partners. Business Processes comprise the set of activities to accomplish a particular objective; they describe the functions and interactions between people, departments, and companies, defining the rules and procedures by which the company runs, as well as the ownership and flow of information. In the Business Processes Layer, codification translates to, among other things, clearly delineated job functions, and clear expressions of workflow and business rules. The semantic stack indicates that the Business Process Layer is not as codified as the application layer. One big reason for this is that—in contrast to the OOD disciplines that we discussed in the Application Layer—there is no commonly accepted discipline for describing much less modeling, analyzing, and engineering good business process.

Nor is there common agreement on how to express business process design. Most of us are familiar with organizational processes that have been passed down over time or that depend critically on one key person. Organizational agility demands the ability to rapidly change business processes to address changing business needs. This means that, like the recipe discussed in the opening of this article, it's all written down in a way that is understood by everyone with a need to know, and, critically, it's accessible by business people so they can change it without needing to rewrite applications.

Business process codification requires a commonly accepted way or a standard of expressing processes. Emerging languages based on XML, such as Business Process Execution Language (BPEL) and Business Process Modeling Language (BPML) provide a means to enable task sharing within and across organizations. Given that there is more than one way to express the business process, there remains codification to be done. Clearly though, businesses seeking agility need to begin the process of describing and defining business processes in terms that can be readily expressed, and hence understood and executed on to different parties in whatever standard emerges.

Codification within the Application Layer and the Business Process Layer allows each layer to be engineered and managed more efficiently. We stated earlier that agility depends also on codification between the layers. Most business processes are supported in some way by application functionality, and conversely, most application functionality exists in support of some business processes. Thus codification between the Business Process and Application Layers means that there exists clear traceability between a business process and its supporting application functionality. Traceability means that changes to a business process—to support a new business opportunity for example—can quickly be translated into changes to underlying applications, speeding implementations and increasing agility. Similarly, traceability means that changes in the application layer—to accommodate a new release of vendor software for example—can be evaluated quickly and accurately for possible impact to business process, eliminating nasty surprises. (See *Traceability, Codification, and The Competitive Environment*.)

Identifying the DNA of organizational agility as a process of codifying tacit into executable knowledge has a number of operational implications. Similar to the simplicity of the mere depiction of DNA compared to the complexity of its implications, highlighting the underlying constituent elements for agility is a far cry from being able to manipulate them effectively to realize their potential. Yet, knowing the underlying *root cause* of agility complements much of the practical and much needed set of other recommendations regarding becoming more agile. It also provides a simple means both to anticipate and to assess the likelihood of other complementary efforts to make your objective of becoming more agile

Traceability, Codification, and The Competitive Environment

Interestingly enough but not surprisingly so, the codification into executable standards has significant implications on the competitive environment. Stated differently, as activities become more codified, the very nature of competition shifts. This tacit codified market transformation process well characterized the 1960s and 1970s with respect to network connectivity, the 1980s, and throughout the 1990s with respect to standard technical architectures and platforms (resulting in today's emerging acceptance of either J2EE or .NET as architectural standards) and well characterizes today's battlefield among enterprise application providers and those attempting to create more standards around business processes. For a quick example, not until Internet Protocols were clearly codified into a set of executable global standards could we witness the rise of Cisco Systems and other (once) network dominant enterprises, nor could we have a reliable network environment enabling the 'plug-and-play' of TCP/IP-enabled devices. With global acceptance of the TCP/IP standards, the competitive battlefield among network competitors shifted. Rather than battling over *which* protocols would underlie global connectivity and "lock-in" the network environment, competitors jostled over *what* architectural platforms, what applications and how to accelerate the speed of those protocols. Thus, what was once a high value, high margin business—defining the TCP/IP standards—became a commoditized, highly scalable, codified business shifting the competitive battleground. It is this competitive logic that we see over and over again and that underlies the underlying bases of organizational agility.

more likely. The final two sections of this article sketch an approach for creating semantic consistency, and some possible next steps to start manipulating the DNA strands of organizational agility.

THE 3D BUSINESS BLUEPRINT—CREATING SEMANTIC CONSISTENCY

A motorist traveling in an unfamiliar city makes sure to consult a map. The maps that most people work with offer only two dimensions: length and width. Such maps show how streets intersect, major landmarks, and the names of lakes and rivers. For getting from place to place, such two-dimensional maps prove very useful. But they offer little insight into *why* things happen or *how* they work. To get an idea of how the buildings and streets remain useful, one needs to look underground at the pipes, wires, cables, support structures, and tunnels that provide water, transfer data, keep the lights on, stop bridges from collapsing, and carry subway trains. Even this level of detail, however, does not provide a complete picture of how a city functions. To know *everything* about a city, one

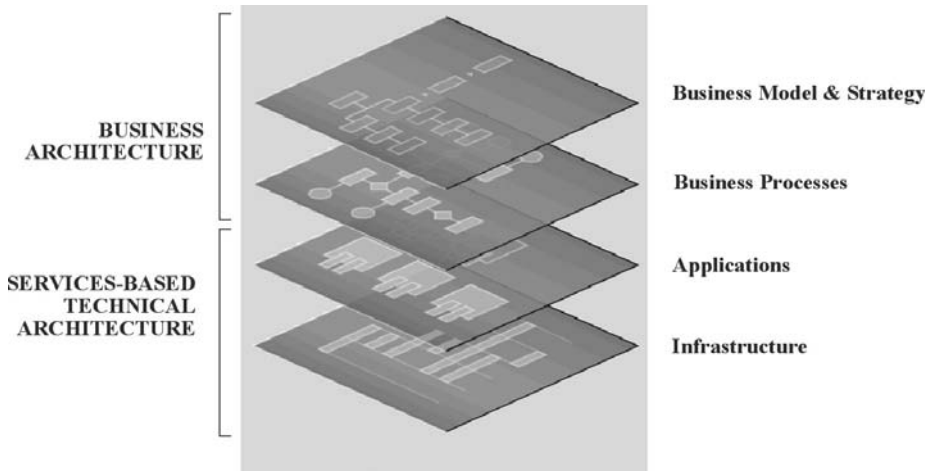


Figure 2. 3D Business Blueprint

must have multiple maps: the documents laying out the principles of planning and governance that hold sway, and those documents outlining the underlying mechanical and electronic operations of the pumps, generating plants, and computers that keep the city humming. Such an ideal map, although far beyond the needs of a motorist, would provide a manager with a complete view of a city, each with its own focus and own set of activities yet all necessarily working together and *linked* together to provide an effective understanding of what has to get done and how it does so.

Figure 2 depicts such a map of an organization, or what we call a **3D Business Blueprint**.

The depicted Business Blueprint consists of four layers analogous to the four layers of an ideal urban map. We'll walk through this blueprint using an example of a national judicial/court system.

In a court system, the top layer, Business Model & Strategy, outlines the principles and goals of the justice system: equal justice under the law, fairness, dignity, and superior customer service. This layer helps administrators, judges, community members, and legislators decide what the court system will accomplish; outlines the measure by which that accomplishment is judged; and maps the social context in which the courts operate.

The second layer, Business Processes, maps the actual work of a court system: filing paperwork, scheduling courtrooms, holding hearings, selecting juries, and issuing decisions. This layer is most analogous to a street map since it distinguishes the processes by which things get done from the particular systems that do them. Quite often, clients discover redundancies and find out how to eliminate them.

Many court systems, for example, have more than one system for processing payments.

The third layer, Applications, maps the types of applications and functions critical to accomplish a court system's work: the software, code, and components that actually get things done.

The fourth layer, Infrastructure, maps the services, routers, servers, and PCs that get work done. Mapping the infrastructure this way lets a court system see what parts of its computer systems do a good job and which ones need replacement. When a court system wants to replace a piece of software with an improved or different one, having a blueprint of this layer makes the process faster, easier, and less costly.

The result is a map of an organization and the abstracted core activities it performs. Each layer has its own set of activities and its set of metrics, priorities, owners, often its culture, and consequently norms, expectations, and behaviors. The core agility challenge as we discussed earlier is to get the alignment *across* these layers to drive the executional consistency needed. The 3D Business Blueprint provides specific codification to help make this happen.

There are three fundamental requirements of this 3D Business Blueprint.

- **Visibility:** The visibility requirement provides the capability to *see across* the activities of each layer. As we've already discussed, silos often result from the different sets of activities, owners, metrics, and behaviors of each of these four layers. Consequently, it is no surprise that *seeing across* these layers often leads to significant disconnects in terms of both understandings and expectations of what has to get done, by when, and by whom. How often have you mentioned to yourself or your colleagues (while standing at any of the layers), "I don't know or understand what they do over there," (discussing the activities at another layer)? The disconnects between John and Mary are examples of disconnects that occur between the second (business process) and third (applications) layers.
- **Traceability:** The traceability requirement provides the capability to know what impacts what, where, how, when, and by whom. This is the capability to understand the impacts of decisions made wherever they occur. Back to our courts example: While having visibility into how things work is important, figuring out *how they connect* is even more important. For example, that a court administrator can quickly understand how a change to an administrative vision impacts every other aspect of a court system's business and, likewise, how changes to a computer system might impact its administrative vision, would offer tremendous savings opportunities if

they could see, anticipate, and understand the impacts that decisions made at any layer would have on others. Or take the financial services Check 21 regulatory change whereby checks can be truncated at banks and their electronic image could become a fiduciary instrument rather than relying solely upon their paper form. Knowing what business processes, applications, and server clusters (among other things) would be impacted in a manner that is explicitly traceable would offer significant savings and fast-mover advantages to those able to do so.

- **Flexibility:** The flexibility requirement provides the capability to make changes to decisions prior to their being carried out by knowing what impacts your decisions will have. Now, many simulation capabilities exist in a wide number of tools—e.g., business process simulations, application estimation and costing tools, etc. Yet, very few exist that capture the impact across all four layers and consequently limit the flexibility critical to modify decisions before they are made.

As we've said, each layer of this 3D Blueprint has its own set of activities, metrics, owners, and behaviors. The challenge, as we've articulated it, is to mobilize the intellectual assets of all of the owners into a common expression of a problem to be solved, and to create common expressions across the layers so that the requirements and expectations at the Business Process Layer (for example) are equally understandable and usable to those at the Applications Layer, and so on. This creation of shared expressions of differences is the crux of creating the *executional consistency* so critical to meet the requirements listed above. *That is what 3D Business Blueprinting is all about. It is a set of tools and methods that create common expressions to drive executional consistency.* Sure, we've all been hankering after these objectives for years, but now we can realize them. There are tools and methods, all based on re-thinking what is common to becoming agile, that can be and are being exploited to help us get closer to the objectives of agility than we have before. Let's describe what some of these challenges mean in practice and how others have tackled them.

FRED SKINNER FACES A CRISIS

Fred Skinner, a court administrator in a mid-sized county, knew how to deal with tight budgets, angry judges, obstinate litigants, and difficult employees. Despite funding that never seemed to keep up with his system's swelling caseload and changing needs, he stretched his budget to provide clean buildings, friendly

customer service, a functional computer system, and even start a few new programs. Normally, he would have been happy that the latest demand for a new program—the state legislature’s mandate to establish a drug court—came with a \$25,000 grant attached. Even though it was only Monday morning, Fred could hardly wait for the weekend. He knew his computer system would need significant upgrades to support the drug court.

The irony of Fred’s situation did not escape him. From the time he moved into the administrator’s office eight years earlier, Fred had made fixing the court’s fifteen-year old mainframe computer system his top priority. A committee of judges, administrators, lawyers, and a few outside experts had visited other nearby court systems, hired a well-known consultant, and eventually selected a court specific software package used in several small jurisdictions nearby. The committee decided that the packaged software offered the lowest risk, the best opportunity for rapid availability of functionality, and excellent long-term stability. The county board agreed to spend \$400,000 on new hardware and software. The next year was Fred’s worst on the job. Getting the system to work properly, Fred discovered, would cost several million dollars and require significant custom development. After spending almost \$300,000 Fred fired the vendor and had to tell an angry county board that the courts still lacked a decent computer system.

Despite some loss of credibility, however, Fred managed to stay employed. After a year of diligent effort, he convinced the county board to allocate another \$800,000 to build a better computer system. With the larger budget in hand, Fred’s committee selected another well-respected software package that several similarly sized counties used. This time things went a little better. Even so, implementing it had meant nearly two years of headaches. The package required substantial customization to meet judges’ individual demands and the eccentricities of local laws. Fred spent several unpleasant evenings answering questions about cost overruns from the county board. In the end, getting the system to work cost \$1.3 million. Then, two years ago, a brief e-mail arrived in Fred’s inbox indicating that the software vendor was shutting down. Fred’s I.T. department received a few disks containing the product’s source code and, with lots of hard work, managed to keep the system running. With no upgrades coming, however, the costly system failed to keep up with the times. (Given all the expensive modifications, Fred wasn’t sure if he would have wanted to risk installing upgrades anyway.) While he sometimes joked that little more than chewing gum and elbow grease kept the system going, few users had serious complaints.

Now Fred was afraid that trying to start the drug court might destroy the delicate balance that kept the computers humming. Narrowly customized to the typical court’s work, the existing system offered no easy way to integrate with the two dozen social service agencies that would share information with the drug

court. His existing IT staff had neither the time nor the skills to modify the dated source code. Installing a new system just for the drug courts would probably cost over \$100,000 and doing that would leave them unable to share information with the rest of the system. Sharing information would probably require a brand new court management system with a price tag over \$1 million. Either way, Fred faced dozens of county board hearings as well as a long and risky upgrade process before he could even think about meeting the drug court's needs. He sat at his computer and set to the unpleasant task of e-mailing the county finance director about his situation. It was going to be a long week.

Fred Skinner's story is fictional, but many court administrators (and others that hold similar positions in different industries) can recognize the realities he faces: tight budgets; mandates to create new types of therapeutic courts; and computer systems that cannot easily meet constantly increasing demands. "We need to be able to use technology more effectively, not only to obtain the information that we need, but to provide public access to the courts as well," observes William C. Vickrey, the State of California's Administrative Director of the Courts. Trying to provide the information required by the changing needs of citizens and institutions, however, proves quite difficult. What Harvard Law School Dean Roscoe Pound said about the law also holds true for the technology that supports the administration of justice: It "must be stable but it must not stand still." Court systems must be solid and reliable, but they must also effectively and efficiently adapt to change—they must become agile.

BUILDING THE AGILE COURT SYSTEM

While the values and traditions of the law remain constant, the regulations, statutes, technology, citizen expectations, and fiscal climate around the courts change constantly. Most administrators foresee certain changes: E-filing will continue to grow; more outside agencies will want to share information with the courts; video testimony will continue to gain in popularity; and information security will remain a vital concern. Potentially disruptive changes will almost certainly occur that radically alter our concept of the courtroom itself: Judges, for example, might start conducting some types of hearings on the Internet and begin to sign requests for temporary restraining orders online. The National Center for State Courts summarizes the challenge this way:

"Over the next 20 years, courts will be required to develop information systems that take into account the fact that they are dependent upon others for the information they need to administer

justice, and, in turn, are a major source of information for others. At the same time, technology developments centered on the use of the Internet are simplifying the task of moving data across institutional and system boundaries. The Internet has generated tools and system development procedures that promise, if used effectively, to make the 30-year-old vision of a seamless movement of information among courts, prosecutors, law enforcement, and corrections a reality instead of a chase after a will-o-the-wisp. We can no longer blame the limitations of our technology for failure. The burden for success now lies on those who must develop sound business practices, not on the technical gurus.” (Henderson, 2003)

An agile court understands how it relates to a wide range of groups: litigants, defendants, legislatures, and the community as a whole. It knows how the needs of the courts and these groups relate to the information underpinning its operation, the processes it uses to manage that information, and the technology that supports those processes. It executes a well-defined mission in a way that drives the alignment of its information, business process, and technology. If the mission or any of these relationships change, an agile court can respond with efficiency and alacrity. To do this, administrative managers and judges must have three-dimensional visibility of the enterprise. They must understand the results of decisions before they are made and comprehend the benefits of spending money before it is spent. In short, they can understand the relationship between actions and the changes they will cause.

For this to happen, plans—ranging from long-term visions to the specific way data concerning litigation gets entered—must align with one another and with the business process and technology that bring those plans to fruition. Such alignment requires the ability to trace clearly among mission, business process, and the actual computer systems that support courts. This traceability ensures that the actual needs of judges, lawyers, litigants, and defendants—and not the restrictions of a particular technology implementation—dictate the way courts do business.

This vision and requirement is not just a vision and a requirement. They can be executed on as well. Let’s use another courts example.

SUCCESS IN WESTERN AUSTRALIA

The Western Australia Department of Justice has created an agile court environment enabling them simultaneously to enhance service, save money, and improve its ability to face the future. (See *Western Australia’s Department of*

Western Australia's Department of Justice

Australia's Parliament created the Western Australia Department of Justice in 1993 as part of a justice system overhaul. Its responsibilities combine those of an American state court system, prison system, states' attorneys' offices, public defenders practice, liquor control board, and vital statistics office. Its jurisdiction covers almost exactly half of Australia's land (an area roughly one-third the size of the continental United States) and includes the cosmopolitan city of Perth, as well as Outback hamlets like Hall's Creek. In its 2003 fiscal year, the department had a budget of about \$450 million. It employs about 5,000 individuals and runs fifty-five local tribunals, district courts for the entire region, a supreme court, a dozen courthouses, and six prisons.

When fully operational in mid-2004, a single Integrated Courts Management System will replace all fourteen legacy systems and meet the needs of everything from the liquor-licensing tribunal to Western Australia's Supreme Court. Each tribunal will retain all the unique functionality it needs and have the ability to share data with every other part of the department. Indeed, the components developed for the court systems prove flexible enough that they even serve as the base for the department's offender management system that has a number of similarities to the courts' systems.

Justice.) The challenges they faced in doing so, however, were complex including a multiplicity of agencies and a wide range of computer systems—the department had fourteen—which made intradepartmental communication difficult and costly. Everything that prisons and lawyers did, as well as much of the work of vital records offices, depended on timely and accurate information flowing from the court system; and the computers did not communicate as well as they might have.

The Western Australia Court project team recognized the *semantic disconnects* that stopped them from reaching their objectives. They recognized the need to bridge those disconnects through creating models and capabilities that not only expressed differences quickly but also could be acted on effectively. In a series of workshops, the Western Australia Department of Justice staff discovered that dozens of apparently discrete tasks were in fact slight variations on the same process—e.g., there were patterns of activities that could be identified and used, again and again. That the business processes requirements could be expressed in a way that the technology designers needed them was an insight that helped break the logjam of working together. Using this information, the department created a series of business models and business process/software components that described and modeled the department's business. The result has been a significantly more agile organization; Rather than having to write new code each time administrators and judges want to modify the system, models were updated reflecting the Department's goals and visions. These modifications create

automatic changes in code and business applications and processes. As a result, the Western Australia Department of Justice can roll out new systems with impressive speed and a cost unlike they've ever experienced before. For the Supreme Court, costs per case finalized (tried, settled, plea-bargained, or dismissed) fell almost 20 percent, exceeding even the department's ambitious internal target by nearly seven percent. In Perth, lawyers filed over 35,000 briefs using a new all-electronic system. Database licensing costs fell by seventy-five percent and maintenance costs were halved. The system also became easier to use: a single, unified manual and training procedure replaced 14 separate ones. Because about a third of the systems' components were reused, all this was delivered at a price competitive to what it would have cost to modify packaged software. After building a system for the district courts (which included a great deal of underlying infrastructure), the court system was able to roll out a full-scale civil litigation system for the Supreme Court in only seven weeks. Building a system for all fifty-five local tribunals, many of which had to respond to particular local laws and customs, took only three months. (See *Western Australia's Department of Justice*.) Nobody can know every challenge or demand the future may bring but it is possible to build a system that provides agility to roll with the punches—to change as the society and its laws change. “Business agility,” says Bob Berg, Director of Information Services for the Western Australia Department of Justice, is enabling the department “to work toward reducing the *pool of crime* rather than reacting to it.”

A 90-DAY PLAN: CONVERTING THE AGILITY DNA TO USE

What's the bottom line here? Simply the recognition that agility is a process rather than any particular end-state, a process with significant implications on the classic elements of an organization: its people, process, and technology. Rather than enumerate what these implications are from each perspective, we list some specific 90-day activities to start exploiting the DNA for organizational agility. (See *The Jericho Principle* for a more detailed description of specific organizational implications engendering organizational agility, from each the perspectives of people, process and technology and with a particular around all of these implications on opportunities and means to exploit emerging collaboration models.)

Some of these implications include:

- *Prioritize (some) projects to help you accelerate the “process” from tacit to more scalable (and hence executable) activities.* Projects tend to generate

tremendous assets and (potentially) new organizational capabilities. Re-evaluating and providing a focus on the process and criticality of codifying certain types of specific assets, particularly in those areas that offer a competitive advantage or will help steer you towards new business opportunities, is a light-weight but high impact activity for your existing projects. So, examine your projects to identify specific and powerful intellectual assets/business value that needs to be extracted and scaled—e.g., a clever way of creating new products, a novel idea that can be converted into a new financial product or service, a new marketing design that should be exploited broadly, an innovative way to integrate disparate systems, and so on. Look at your business processes, your technology applications, among other activities, and figure out if you have a common way to express them, to model them, to communicate about them, or to develop *shared semantics* across them. An evaluation of this type is a critical first step in starting the codification process. This entails becoming acutely sensitive to how you define and communicate. We often hear about disagreements, “Ah, that’s *just* semantics.” Our counter would be, “Semantics are all we have,” and shared semantics are critical to execute consistently.

- *Examine your top ten strategic initiatives; “grade and shade them” against the semantic stack in terms of the degree to which the project activities are codified.* Every project has particular assets and best practices that can and should be exploited by many in the organization. To start getting more agile, start thinking about how you can, programmatically, start to exploit the codified patterns (and activities) you see across these top ten projects.
- *It’s all about standards, standards, standards.* There is strong agreement among CXOs, in the report, *The Agile Corporation*, cited earlier, that minimizing obsolescence through open standards will be one of the principal criteria for investing in new technology. (Unisys Corporation, 2003) A quote from one of the report’s respondents was, “choosing IT vendors with open solutions that facilitate the easy adoption of new technology and standards will be more important than least-cost solutions.” Why is this? For the simple reason that your scarce time and great talents can focus on *what* the value is to be gained, rather than *how* to get them connected to each other. Again, following through the agility DNA argument above, it is clearly easy to see and understand the reasoning for this statement. After all, at their core, what are standards? Nothing more than the codification of best practices that have been refined in the crucible of the marketplace; using standards, then, are simple and logical means to reduce your risks and increase using the *brains of the many*.

- *Work with your service providers to give up their proprietary methodologies, tools, and frameworks.* Instead, challenge them to provide a means for all of their different methodologies, tools, and frameworks to work together collaboratively—in other words, in some form of *collaborative delivery framework*. Again, this is a means to reconcile their differing underlying semantics.
- *Begin to assess where and with whom to partner to accelerate the scaling process.* The marketplace uncertainty we face and dynamic pressures with which we all deal requires an agility to respond as competitive plates shift opening up specific market inefficiencies and opportunities that need to be exploited quickly. A problem many of our organizations face, however, is the difficulty in responding effectively. It's just too hard to mobilize resources internally to respond. Enter collaboration. Collaboration is becoming a critical capability to mobilize resources from different parties to exploit fast moving opportunities. They are a means around our well-structured processes. They offer an opportunity to build upon core strengths of one, two, or more companies in a nascent business environment that can be structured outside of our traditional processes to take advantage of particular market opportunities. Consequently, looking to partner, to collaborate, and to pool shared assets, collaborative capabilities are increasingly becoming less a nice-to-have than a strategic necessity. They serve as additional means of accelerating organizational agility, agility through partnerships. (Welborn and Kasten, 2003)

The bottom line is this: There are four separate but complementary activities that comprise a 90-day plan, the business results of which can help you position yourself both strategically and operationally to manipulate the DNA of organizational agility:

- 1) Accelerate common and shared frameworks and standards from as much the business as the technology sides of your house, and through this process, identify the core assets to harvest, to leverage elsewhere (those hidden, tacit-assets that actually drive your value as opposed to the formal declarations that proclaim they drive your value). Re-evaluate your top ten strategic priorities to exploit/codify intellectual assets that can be scaled—*the re-use issue*.
- 2) Work with your service providers to express their tools, methods, and approaches in some form of collaborative delivery manner—*the delivery issue*.

- 3) Begin to assess with whom to accelerate the scaling process to take advantage of your assets—*the collaborative issue*.
- 4) *Examine your core value proposition from the perspective of the semantic stack to re-evaluate potential business partners, competitors, and strategic initiatives—the competitive positioning issue.*

FROM TACIT TO EXECUTABLE—THE CRUX FOR AGILITY—ONE MORE TIME...

Executing quickly and efficiently across the breadth of any organization requires that many people be able to “make sense” of a new business opportunity, and then “take action” effectively. New market opportunities are often high margin and/or high revenue potential opportunities, the results of their underlying value proposition being novel, and consequently, relatively unexploited or difficult to replicate. These opportunities tend to be derived from someone having an idea or “seeing the opportunity” that others have not seen or have not been able to execute on. A challenge for effective and scalable action depends upon taking this “tacit” idea—the knowledge in someone’s head around the particular new business opportunity—and “scaling it” so that others can understand, mobilize, and execute on the opportunity. “Taking action” effectively, then, depends upon codifying this tacit knowledge into some forms that can be used, and used such that it can be used by many, or sufficiently scaled that it can be executed broadly.

This process of codifying and scaling tacit knowledge into well-defined business processes, technology enablers, and other “hard” assets and artifacts that many others can use consistently, effectively, and cost-effectively determines whether or not an organization can be and is agile. How so? Being agile requires a critical mass of people and underlying processes supporting those people to be able to move quickly in response or in anticipation of specific opportunities. The only way to mobilize such a broad base of people and processes moving in a directed fashion is through a shared understanding of what is expected, of what to do, of how to do it, and of measuring the value of those actions. We often hear the discussions around *standards*, *frameworks*, and the need for *shared business and/or technology semantics* for effective action, all of which reflect the end result of this process of codifying ideas, nascent value propositions, and best practices into organizational activities and means that can be scaled. And it is this *process* of codification that comprises the underlying DNA for organizational agility. The resulting agility mantra is simple: *the more codified, the more executable; the more*

executable, the more scalable; the more scalable, the more agile; and the more agile, the more competitive.

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9

AGILE TO ADAPTIVE



Making Organizations More Responsive to Customers—A Xerox Case Study

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“It’s the customer, stupid,” Anne Mulcahy, chairman and CEO of Xerox Corporation, told the World Business Forum in New York City in May 2004. “That’s what I’ve learned is the basic truism for any business.”

Mulcahy learned it the hard way. When she was thrust into the leadership of Xerox to pull the company back from the brink of bankruptcy in 2000, she found that customers were irate: “While our customers were loyal and wanted Xerox to survive, our response to them had slipped badly.” According to Mulcahy, losing customer focus was “...one of the things that got Xerox in trouble. We weren’t listening to the customer as closely as we should.”

In developing the ambitious plan for Xerox’s successful turnaround the company set a goal of transforming itself to put a strong focus on rebuilding customer loyalty – to become more agile and adaptable so that it could better meet any and all customer problems and needs quickly and completely. It began making changes in the company so that its people could take the actions needed to rebuild focus on its customers, one-by-one...so people at all levels in the company

could become more tightly connected to customers and their businesses—and understand better what they had to do to help their customers upgrade their experience in dealing with Xerox. The challenge was to:

- Identify and develop a clear understanding of all of each customer's current problems – down to an individual end user, if necessary
- Quickly translate that knowledge into specific, appropriate actions to resolve each problem
- Track the results of those actions and learn from them

At Xerox, as with many information technology suppliers, this challenge is compounded by the fact that, especially in a large customer organization, there may be hundreds or even thousands of end users of its equipment or services or the documents produced by them.

Xerox needed to build a way to not only enable these thousands of customers to communicate their individual problems to its account sales and customer support people, but also ensure that its people then addressed those customer problems quickly. Equally important, it needed to be assured that the customers were satisfied that the Xerox action had, indeed, solved their problem.

The Sentinel Customer Satisfaction Assurance System™ was developed to do just that. It is directly aimed at dramatically improving an individual customer's satisfaction with Xerox by identifying, understanding, and rapidly and appropriately responding to his or her current problems and needs. The situation that Sentinel was created to address will be familiar to many companies. Here's how the problem played out at Xerox.

THE HIDDEN PROBLEM: UNKNOWN AND UNSOLVED CUSTOMER PROBLEMS

Senior Xerox operations executives were very concerned by the continued loss of good customers, and by the fact that the Xerox satisfaction measurement data gave them few clues as to why customers were defecting or what specific corrective action Xerox might take to keep them. The satisfaction data was an enigma. Xerox managers found they did not assure customer loyalty and did not provide the specific information Xerox needed to increase customer retention.

Vince Vaccarelli and his Xerox Business Research Group (XBRG) team was asked to undertake a formal investigation into the satisfaction measurement process and ways to make the data more useful in actually building customer loyalty. It

found a multi-faceted problem incorporating both measurement methodology, data analysis and reporting, and a much broader customer relationship issue—the timely identification and resolution of specific, individual customer problems down to the end user level in a given account. (For a more detailed description of the XBRG findings see Inset 1: XBRG Findings On The Xerox Satisfaction Measurement Process—Seeing The Forest, Not The Trees.)

INSET 1: XBRG FINDINGS ON THE XEROX SATISFACTION MEASUREMENT PROCESS—SEEING THE FOREST, NOT THE TREES

Like many other large companies, Xerox formally tracks the satisfaction of its customers using conventional satisfaction measurement techniques based primarily on surveys conducted by its customer operations units. XBRG looked first at who in customer organization provided input on satisfaction.

As with most companies in information technology markets, Xerox's relations with customer organizations occur on several levels:

- Senior customer executives who must approve expenditures or contracts for large equipment or service procurements
- Customer purchase decision-makers who evaluate, recommend and administer procurements of Xerox offerings and contracts, and with whom Xerox representatives typically have day-to-day contact
- End users...the hundreds or thousands of operational and functional people in the customer organization who actually request and use Xerox products and services, or the documents and information produced by them

Xerox account managers and senior executives charged with supporting high-level, personal relationships with Xerox's largest accounts hear directly from customer executives about satisfaction in face-to-face meetings and other conversations. Customer purchase decision-makers also provide anecdotal information on satisfaction in the same way.

However, the primary means of collecting formal satisfaction data from customer decision-makers has been the Customer Satisfaction Measurement System Survey conducted by Xerox customer operations units around the world. Here's how the data is actually developed:

Periodically a random sample of purchase decision-makers is chosen from the list of current accounts and interviewed. Questionnaires

ask customer decision-makers to use a numerical scale to rate their satisfaction on various factors including Xerox sales support, equipment installation, technical support, user training, and equipment or service center performance. Survey data is then aggregated and reported on a regular basis to customer operations and corporate management. Aggregated rating data is also included as input to Xerox's annual customer satisfaction, improvement planning processes.

XBRG found that, while these data are useful for identifying broad trends and formulating general policies for customer satisfaction, their measurement and customer action support problems limit their value to customer operations units. Those units need to take immediate actions to retain specific customers and build customer loyalty, and the data is inadequate for that purpose.

The Satisfaction Measurement Problem – Masking customer problems... aggregation risks aggravation

In its investigation XBRG found that the aggregated satisfaction data across a broad customer population produced by the above process masks the individual problems or conditions that often produce customer defections, like missing the bad apple in the barrel by looking at the average condition of a sample of them. XBRG found that a key reason why problems are masked is that the typical survey-based processes do not immediately and continuously communicate the level of satisfaction or problems of individual customer end users to Xerox customer operations or support organizations. By depending on these surveys, XBRG found that Xerox was often the last know about these problems.

As important, XBRG also found that the actual satisfaction survey respondents, purchase decision-makers, were unlikely to be aware of the true level of end user satisfaction or problems in their own organization—good or bad. Purchase decision-makers rarely, if ever, hear compliments or laudatory comments from end users. But individual complaints or reports of problems, even rare or random ones, do bubble-up and are funneled to decision-makers. In fact, sometimes problems are the only things a decision-maker hears from end users about Xerox. XBRG concluded that such experiences could lead purchase decision-makers to an overly negative, and possibly unwarranted view of Xerox performance in their organization—to perceive Xerox as unresponsive to their needs.

In addition, XBRG found that Xerox account sales or local support teams simply do not have the ability to constantly scan hundreds or thousands of customer end users to identify all unresolved problems these individuals may have. And support organizations may also not have the resources to track the quality of

their responses to determine if or when the customer becomes truly satisfied. Yet either instance could cause Xerox to be perceived by customers as unresponsive, leading to the possible loss of important accounts.

The conventional Xerox customer satisfaction measurement system provides limited support in these situations. Like other such broad-based, survey-driven systems, it is primarily designed to capture data and report on broad issues and trends in customer satisfaction across an enterprise, not to continuously trigger and track action to solve specific problems of all individual customers. Exacerbating the situation the typical lag between the completion of a survey and the resolution of any individual problems identified in a survey could be more than six months, further cementing a perception of unresponsiveness in the minds of affected customers.

Customers leave a relationship with a supplier one-by-one, with each having its own specific problems or issues that eventually provide sufficient motivation to end the relationship. As customers are lost one-by-one, so must they be saved. XBRG believed that what was needed was specific information that would allow Xerox customer support people in a particular account to:

- Quickly identify, understand and determine the appropriate action needed to deal with any and all problems of individual end users
- Ensure that those responsible actually take the appropriate action in a timely manner; and determine that the action taken truly resolves the customer's problem; if not
- Ensure that additional action is taken until the customer is truly satisfied that the problem is solved

THE SOLUTION: A NEW WAY OF KEEPING SATISFIED CUSTOMERS...KEEPING CUSTOMERS SATISFIED

The Xerox Business Research Group's investigation found that the basis of customer satisfaction is an absence of problems, or, the quick resolution of them.

- That an important underlying cause of losing customers is an inability to resolve individual end user problems in a timely manner and to the customer's complete satisfaction;

- That end users of Xerox document management products and services depend on the documents or information produced by those products or services to run their operations. To them, the consequences of a problem can be extremely serious, so they are often quite vocal about and influential in the choice of document management suppliers;
- That end users are, however, widespread throughout customer enterprises, and Xerox sales and service support resources, being finite, are unable to continuously query these large and dispersed populations for problems they may have;
- And that existing satisfaction measurement systems were not designed to provide support to Xerox account teams in doing this. They were neither an effective way for individual customers to communicate their specific needs directly to these support groups nor a timely way to ensure these needs were completely and satisfactorily fulfilled.

In his book, *Adaptive Enterprises: Creating and Leading Sense-And-Respond Organizations*, Stephan Haeckel argues that it has become almost impossible to predict and plan in advance for customer problems and opportunities, especially with information-based products and services. Haeckel states that successful organizations must, instead, become adaptive; to learn how to continuously identify and understand these problems or opportunities as they occur and respond to them quickly and appropriately, customer by customer. Successful adoption of this adaptive mode of operation, he suggests, requires that an organization install the capabilities and management context of what he calls the Adaptive Loop, which shows the flow between the Sensing system, of sense and interpretation, into the Response system, of deciding, and acting. It enables people on the line to continuously receive information from customers, understand what it means, decide on and take appropriate action and, then, repeat the cycle, factoring in and learning from the customer's reaction to the previous cycle.

Vaccarelli believed that Haeckel's concepts of adaptability and sense-and-respond—and the management context and processes they install—could provide the underpinnings of a solution to Xerox's problem with satisfaction measurement and, ultimately, could cure the real problem of customer satisfaction and retention.

He thought that these concepts would help Xerox ensure that:

- The current level of satisfaction of all individual customers and all their people was known and continuously updated throughout Xerox;
- All problems leading to current dissatisfaction were clearly identified by individual users in their own words, and reported directly to the Xerox people responsible for their resolution;



Figure 1. Desired State: "Adaptive Loop" Applied by Xerox

- Xerox people were prompted and motivated to take the timely actions needed to resolve each individual problem until the affected customer was completely satisfied.

What the XBRG sought was a way to use Haeckel's Adaptive Loop to develop a management process that would simultaneously solve the satisfaction measurement problem and enable the Xerox sales and support people responsible for the satisfaction of individual customers to, as shown in Figure 1:

- Continuously sense or receive explicit information from all individual end users in any account, their level of satisfaction or the problems that they have

- Immediately interpret that information to understand whether a user is satisfied or whether a problem exists, then determine the nature of that problem, and identify what is needed to deal with it
- Decide on and commit to an appropriate course and schedule of required action
- Carry out that action commitment
- Receive information from the customer on whether or not the action had resolved the complaint, repeating the cycle, if necessary, until the customer is satisfied that the problem is solved

The last two of the above steps were especially important to implement. Jeffery Pfeffer and Robert Sutton in their book, *The Knowing-Doing Gap: How Smart Companies Turn Knowledge Into Action*, observe that many organizations fail to turn their knowledge about specific situations into effective action—that these organizations may know exactly what to do, but often they don't do it. Pfeffer and Sutton argue that processes that encourage an action orientation—interaction with customer situations, confronting and dealing with serious problems directly and quickly, follow-up to ensure that what was said is actually done and is effective—are needed to motivate actual individual performance of appropriate actions.

From this, the XBRG team realized that to craft an effective solution to Xerox's customer retention problem, adaptability (understanding any and all problems customers had, and developing appropriate responses to them) had to be married to agility—learning not just to respond to a customer quickly, but also to change the response if the customer wasn't satisfied with what was being done. As John Grinder, principal inventor of the Precision Model of learning and communication, put it, "If what you're doing isn't working, don't keep trying harder to make it work, try something else...fast!" The team concluded that any satisfaction measurement it recommended had to support this end.

In their books, both Haeckel and Pfeffer and Sutton point out that achieving organizational adaptability and agility usually requires a substantial change in the culture of an organization and its people, moving from an analyze-plan-deploy at the center-of-the-enterprise model to a see-know-commit-act at the edge-of-the-enterprise basis and changing its orientation from company-out to customer-back.

The XBRG team believed that improving satisfaction and retention, customer by customer, should not require an overt culture change of this scale, although a successful solution to that problem could well change the basis of behavior throughout Xerox over time. It thought the scope of change could be managed by sharply focusing the solution on individual customer teams interacting with individual customers.

But XBRG did conclude that a change in the culture and behavior of individual Xerox customer teams and support people was needed to make them even more responsive to customers. The team thought that, if astronauts could be conditioned to continuously sense problems in their environment and respond to them, so could the Xerox customer support teams. XBRG concluded that the modified adaptive loop process, shown in Figure 1, could produce the conditioned learning needed to do that.

THE SENTINEL CUSTOMER SATISFACTION ASSURANCE SYSTEM™

What the XBRG team wanted to do was find a simple solution to Xerox's customer satisfaction measurement problem: one that would reverse the current state they had found. They wanted to:

- Provide Xerox people as well as customer executives and decision-makers with a current and accurate view of the actual state of satisfaction at any time in any individual account—good or bad, compliments as well as complaints—not aggregated, and possibly out-of-date or unwarranted, perceptions from survey data
- Make sure that Xerox people were the first to know about, and respond to, any and all customer problems—not the last

In addition, the XBRG team believed that any solution they recommended had to:

- Provide a direct communication link at any time between any and all customer workers who rely on Xerox and the Xerox team that supported them
- Be easily and quickly deployed to any Xerox account anywhere in the world
- Require little or no training or time for customers to use, and capture their problems and comments in their own words
- Provide a way of managing the action commitments of Xerox people to prompt, motivate and track response to customer problems
- Provide for learning by doing or experiencing, based on the Xerox response to problems and comments, for both Xerox people and customers who directly experience Xerox.

The solution that resulted from XBRG's investigation is Sentinel, a Web-based customer relationship management system that has capabilities unique enough

for Xerox to seek patent coverage. Configured, as shown in Figure 2, around a relational database and custom software developed by XBRG’s research partner, International Business Research Center, Inc. (IBRC), Sentinel is a sense-and-respond system that detects and helps manage the resolution of customer problems, and then structures and reports the customer and Xerox information collected so learning can take place from both the nature of the problem and the way it was successfully resolved (for a brief functional description of the system see Inset 2). After more than a year of successful field testing, Xerox is now deploying the solution to all of its largest accounts worldwide.

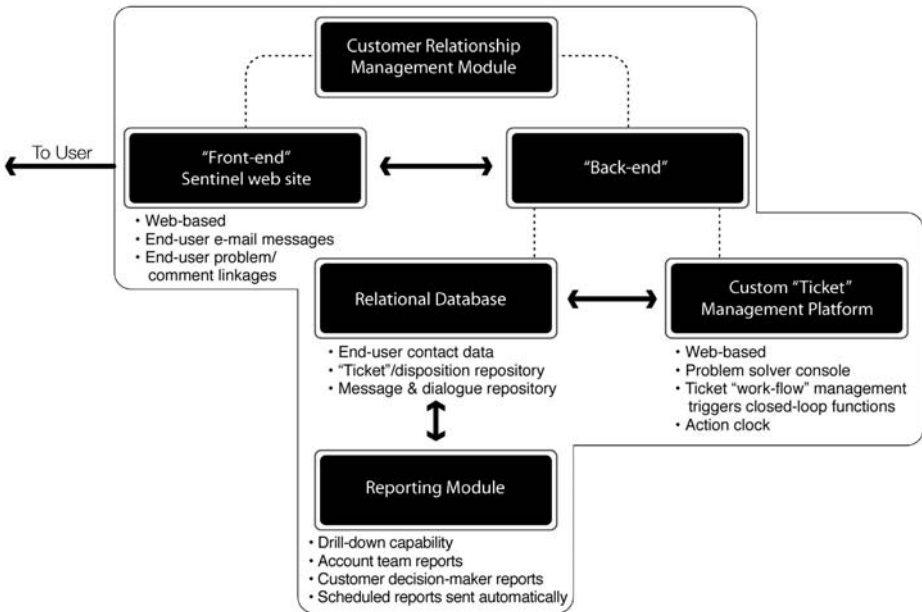


Figure 2. Sentinel Functional Building Blocks

HOW SENTINEL WORKS

When a customer organization agrees to participate in the program, it provides a listing of the e-mail addresses of all people in that organization that rely on Xerox products, services, support or business processes in any way.

Sentinel works on the simple premise that satisfaction stems from an absence of problems. At a set interval or upon the completion of an event Sentinel e-mails a check-in to each person in the organization, a short message: “Are you experiencing an unresolved problem with Xerox?” If the people receiving the

INSET 2: FUNCTIONAL DESCRIPTION OF SENTINEL SYSTEM BUILDING BLOCKS

As shown in Figure 2, at the heart of the Sentinel system are its customer relationship management (CRM) and reporting modules. The CRM module implements Sentinel's adaptive loop and forces action on the part of Xerox problem solvers. The reporting module provides the critical capability for Xerox and customer managers to see into the system to monitor Xerox performance and customer end user satisfaction.

The front-end of the CRM module is the a Web-based presence that provides the automated two-way communication link through which Xerox continuously senses customer end users' satisfaction or unresolved problems. Using a customer-provided list of e-mail contacts of end users who will participate in the Sentinel program, the front-end manages the automated e-mail system that sends the end users periodic or event-based check-in messages. It also provides the automated Web-based linkages and tools through which users can respond to check-ins with problems, comments/compliments or suggestions and receive confirmations of those. The front-end also provides the Sentinel Web site that customer end users or managers can access 24/7 to report unresolved problems at any time between check-ins or to access Xerox performance data and reports.

The CRM back-end consists of a Web-based relational database and customized ticket management workflow software platform.

- The relational database stores all customer-provided end user e-mail and other contact data. It also stores a complete trail on all end user responses—unresolved problems comments/compliments, and suggestions, including problem ticket records and verbatim end user/problem-solver dialogues.
- The ticket management workflow platform provides the Sentinel system's automated closed loop problem and commitment management capability. It is the system element that forces and tracks action. It starts the clock when an unresolved problem is detected; tracks the Xerox problem-solver's response; and escalates the case for management action if response is not made within the required time window. It also provides a console where Xerox problem solvers interact with, assign resolution responsibility for, and manage all open end user problems or comments. This workflow platform was custom-developed by IBRC because no commercial system could provide the flexible capabilities needed to implement Sentinel's design goals.

- The reporting module is based on licensed reporting engine software. Using information stored in the relational database, it provides an automated capability to produce reports of Sentinel activity, user satisfaction, and problem resolution for both Xerox and customer managers. It also provides the capability for Xerox and customer managers to drill down on any variable in standard reports, all the way to original verbatim end user or problem-solver messages, if desired.
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message have no problem, they simply delete it with the understanding that, by deleting the message, they are really answering that they are satisfied with Xerox's current performance.

If an end user does have an unresolved problem or a comment, he or she clicks on the indicated link in the message. In the message that results, the customer can click on a happy face or light bulb and write a comment, compliment, or suggestion. Users with a problem, however, click on a frowning face; that opens what XBRG calls a conditioning loop, a process for immediate resolution of the problem by Xerox.

Users are linked to a Web site where they can freely explain the problem in their own words. The system immediately notifies a designated Xerox problem solver, creates an electronic problem ticket, prompts an immediate telephone call to the customer, and starts a tenacious commitment management loop that keeps the issue active until customers confirm that the problem has been resolved to their satisfaction. And, if for some reason resolution of the problem does not take place within a set time, which is most often 24 to 48 hours, the Sentinel commitment management system elevates the resolution process in the Xerox support group to accelerate progress.

HOW SENTINEL IS DEPLOYED

Sentinel was designed to be quickly and simply deployed anywhere in the world. The basic content of customer check-in e-mail messages and linkages use either graphics that are universally understood or language that is easily translated. The same is true of the Xerox problem solver problem and commitment management consoles.

Formal training of new Xerox problem coordinators requires only one to two hours; once their customer organization goes live on Sentinel, the check-in, problem identification and resolution, and response processes should be at or above expected performance in less than 30 days.

Sentinel is usually presented to new customer candidates as the new way Xerox has developed to communicate with and better serve customer organizations, down to their individual end users. Approval of participation in Sentinel by customer management has been reasonably fast; customer executives readily recognize and appreciate the benefits of this Xerox innovation. Once approved, XBRG assists the customer in obtaining end user contact information that is loaded in the Sentinel customer relationship management database, and the first check-in process is planned and implemented.

UNIQUE CHARACTERISTICS OF SENTINEL

Although at first glance, Sentinel may seem to be a variation of conventional satisfaction measurement systems, XBRG's Vince Vaccarelli and Barbara von Bergman, co-inventors of the system, say that: "Sentinel is about as much like a satisfaction survey as radar is like a flashlight, it differs in both scope and execution." The pilot tests and deployment of the system have shown that it (a) eliminates or corrects many of the critical deficiencies of survey-based systems, (b) provides for experience-based learning in problem resolution, and (c) provides more timely management information on customer satisfaction, problems and response: information that can help assure and improve the customer experience with Xerox.

COMPARISON WITH SATISFACTION SURVEYS

First, Sentinel eliminates any problems with quality of the data that may be caused by the sampling techniques used by conventional surveys, including the possibility of overlooking people or organizations with serious satisfaction issues or problems because they weren't included in the sample. "Every worker in a customer's organization that depends on Xerox for something is contacted every time," says Vaccarelli. "That means that Sentinel can even catch nascent problems and solve them before customer decision-makers or executives are aware they exist."

Second, Sentinel eliminates most of the complaints customers have with conventional surveys—long surveys that often require respondents to deal with questions that do not apply to them or rating scales that are tedious to use. These are complaints that lead to poor survey response (only about 20 to 30 percent at best) and, therefore, potentially unreliable data. Barbara von Bergman, points out that, "If you're satisfied, and most people we contact are, it takes almost no time

to answer a Sentinel query...all you do is delete it; by doing that you know you've answered our main question."

Third, by capturing and reporting the customer's own words, Sentinel minimizes the possibility Xerox may misinterpret the nature customer problems or compliments received. This improves both the quality of the Xerox response to the customer and quality of the learning from the information collected.

Finally, and most important, if a customer does have a problem, Sentinel initiates an immediate response to it eliminating any lag due to the analysis-reporting-problem solving process associated with conventional customer satisfaction measurement systems. According to Vaccarelli and von Bergman, "This is probably the feature of Sentinel that is most appreciated by both customers and Xerox people. Customers are happy because Xerox now quickly solves problems that we may have missed before. Xerox people are happy because Sentinel helps them find and solve problems ...turning them into 'pluses' that keep customers coming back."

EXPERIENCE-BASED LEARNING

Sentinel teaches Xerox people to sense what's going on and make adjustments in real time. They no longer wait until a customer complains and then enter into a protracted problem-solving process. By prompting engagement with a broad variety of problems and by requiring use of different approaches until they are solved, Sentinel is helping Xerox people learn more about the circumstances under which certain problems might occur, what works and what doesn't, and what they have to do to satisfy customers completely. According to Vaccarelli, "We know conditioned learning is taking place by the increased speed with which the same problems are being solved and by the fact that, over time, some problems no longer come up because our people are anticipating and preventing them."

Working with Sentinel is also teaching Xerox people the broader value of being customer-back rather than company-out in their relationships with customers. Sentinel encourages Xerox people to pay more attention to creating added value for end users, solving their problems and making them more successful, and the result is a real business benefit. As one Xerox account manager puts it, "I'll bet the company has probably lost business in some accounts because we didn't have something like Sentinel." According to the Xerox account manager for a major financial institution, "The information that Sentinel provided our sales team is one of the major reasons we were able to renew the contract with our customers... it's a competitive differentiator."

Sentinel also conditions customers to give more feedback to the Xerox people who support them because they have learned that it will be acted on. In the past, customers might have given up responding to surveys because they perceived that Xerox's response often came too late to resolve their issues. Now customers can clearly see the value of their cooperation in the program through the speed and quality of the Xerox response to the problems they identify. Their perception of Xerox has improved, and their communication is becoming more proactive.

INFORMATION THAT MANAGEMENT NEVER HAD

One of the most important by-products of the Sentinel system is the real time, up-to-date information that it provides to Xerox management about the state of satisfaction across the customer base covered by the program. Sentinel provides Xerox account teams and senior managers with current information to track:

- The overall level of end user satisfaction in an account
- The number and nature of compliments customers have made
- The problems it has found and is working
- The progress and responsiveness of Xerox problem solvers in dealing with those problems
- The nature and success of solutions developed
- The reaction of affected customers to those solutions

If necessary, Xerox managers can drill down to the specific verbatim comments of customers or Xerox representatives on any of these dimensions.

Sentinel data shows, for example, that response rates to Sentinel e-mail check-ins are low. Unlike conventional surveys, that's good news, meaning that customer end users are, for the most part, satisfied with or even complimentary about Xerox performance. On the other hand, customer check-in responses reporting a problem, most concerning quality or service support, are lower than 1.5 percent of messages sent, and half or more of those are now resolved within 48 hours. That's very good news.

This is powerful information that Xerox people have never had before, with a level of quality and timeliness unattainable by any other means. It allows local teams to manage relationships with accounts better than ever before. It alerts senior management to deal with problem situations before they become a threat to customer loyalty and retention. No wonder that Xerox CEO Anne Mulcahy told a group of senior executives of the largest customers of joint venture partner

Fuji Xerox, “Sentinel information is a real CEO tool. I use it every day to check on how we’re doing with all the Sentinel customers as well as the account I personally support.”

When made available to customer decision-makers and senior executives, Xerox has found that Sentinel data is seen by those key customer managers as a important source of added value in doing business with Xerox, and in some cases, a significant factor in their decision to continue doing business with the company. Sharing Sentinel data with customer decision-makers and executives gives them the ability to understand and track Xerox performance in their organization— to see how well Xerox is doing and help them work with Xerox to improve performance. And sharing Sentinel data with customers can help Xerox correct possible misperceptions of prevalent problems or Xerox unresponsiveness with solid data on high levels of end user satisfaction, the relatively small number of problems detected and how quickly Xerox has responded to them. As senior executives of current customer participant put it, “The initial results have been good. It (Sentinel) provides us an easy, non-threatening way for us to give you feedback. This is the type of innovation we are looking for from our business partners.”

MEASURES OF SUCCESS

Sentinel is a sense-and-respond customer satisfaction measurement and problem resolution system. Its primary purpose and goal is to build a foundation of strong customer satisfaction on which Xerox can build strong customer loyalty.

The critical customer-oriented measures of success for the Sentinel program include:

- Improvement in the overall Xerox Sentinel customer retention rate
- Assured overall satisfaction of the Xerox customer base
- Assured end user satisfaction in individual customer organizations
- Improved customer perception of Xerox as a high-value business partner

The critical Xerox-oriented measures of success include:

- Increased Xerox team awareness of customer problems and needs
- Increased Xerox team responsiveness to customers
- Improved account management and control
- Improved account team satisfaction

The Sentinel program began its first pilot test in 2002 and has only expanded significantly since mid-2003. Substantive and conclusive data on most of the critical success measures for the program are, therefore, not yet available. But early customer results are strongly encouraging:

- Improvement in satisfaction in field test accounts is significant, rising from 80 to 95 percent in one national customer organization
- Qualitative and anecdotal evidence indicates that customer loyalty has improved among participating customers. Several have said that their decision to continue or renew business with Xerox was very much influenced by their participation in the program
- Customer executives in Sentinel accounts have told Xerox account teams and Xerox executives that their view of Xerox as an innovator and business partner has improved substantially since beginning Sentinel participation
- Acceptance and use of Sentinel data by customer decision-makers and executives is prevalent and growing
- End users in Sentinel accounts are providing an increasing number of compliments and positive feedback about Xerox performance

Results on the Xerox side are also encouraging. As mentioned previously:

- Problem check-in reports are stable at one percent or less of total check-ins sent
- Half of problems reported are resolved in less than 48 hours
- Xerox team learning by doing has led to significantly improved performance. Problem resolution, for example, improves quickly after installation. In new Sentinel accounts, about 30 percent of problems are resolved within 48 hours; in ongoing accounts, more than 60 percent are

Other encouraging Xerox results include:

- Increased and effective use of Sentinel data by account managers to improve customer operations and communication, maintain or improve Xerox position in the account and secure new business
- Increased use of Sentinel data by Xerox focused executives—senior Xerox people dedicated to support of a specific major customer—in tracking their assigned customer organization and improving relationships with it

CUSTOMER EXPERIENCES WITH SENTINEL

Xerox experiences in three customer organizations participating in Sentinel: a global banking and financial services organization; a multinational, multi-division technology manufacturing company; and a regional government hospital administration organization, further amplify the early success and future promise of the program.

Global Bank

Xerox provides all of the United States facilities and lines of business of this international banking and financial services organization with:

- Thousands of conventional and digital document production and management products through an office fleet management program where Xerox leases and provides on-site replenishment and maintenance services for all equipment
- Production, finishing, fulfillment and graphic design services for most of its internal black-and-white and color documents
- Other document management services such as mailroom and image capture and conversion

Currently, Xerox uses Sentinel to communicate with end-users of the document production services it provides. Xerox operates four consolidated Document Centers for the bank in the United States. These centers produce 70 percent or more of the internal documents the bank needs to ensure it consistent services to customers and regulatory compliance throughout all of its lines of business and facilities nationwide. The documents produced include high-volume applications such as training manuals, product manuals for all of the lines of business, six-sigma quality improvement documentation and graphics, and other key internal operations and administrative documents as well as some direct mail product promotional documentation.

On behalf of the bank's lines of business, its Document Management organization administers all product and service contracts with Xerox and is responsible for ensuring that Xerox is meeting line of business requirements. To carry out that responsibility, in 2002 bank Document Management executives approached Xerox to see if the company could provide a way for the bank to monitor the level of end-user satisfaction with Xerox's service performance. To provide that capability, the Xerox account manager, who had recently learned

about the program, recommended participation in the initial pilot test of Sentinel. The bank agreed and the system was installed to cover all end users served by the four Xerox-staffed Document Centers.

To date, Sentinel has been a success. Both Xerox account management and customer executives agree that Sentinel fulfills the satisfaction monitoring role and, more important, has been an important contributor to building and maintaining Xerox's high level of service quality for the bank's lines of business. Sentinel provides both Xerox and customer managers with a high level of confidence that: (1) any service level problem will be proactively identified by Xerox; (2) that there is a process in place to by which Xerox will respond that problem in a timely manner; (3) the resolution of the problem gets documented in the end-user's own words.

The system provides both Xerox and bank managers with factual data and solid verbatim evidence to show that Xerox is meeting or exceeding its service level agreements and improves performance quickly where that it is needed. The Xerox account general manager points out that, "The information that Sentinel provides was an important enabler in our effort to renew the contract with our customer...we had objective data to substantiate and quantify end-user satisfaction and continued improvement in levels of service. It also helps us in new business situations because we can confidently talk about the demonstrated levels of quality we can deliver."

Senior bank executives have told Xerox that they perceive Sentinel as an industry benchmark, "very creative...state-of-the-art...brings in new value-added to the business...what we want in a strategic supplier." The bank's Document Management organization is now considering possible deployment of Sentinel to end-users covered by their massive equipment fleet management contract with Xerox.

Government Hospital Administrator

Xerox holds the master contract to provide the digital multifunction document management equipment distributed throughout this group of five large regional federal government medical centers. The contract covers several hundred separate pieces of equipment as well as account associate equipment operators in all five facilities.

The primary purchase decision maker for this customer had been asking Xerox account team for some capability to communicate more closely and frequently with end users of the equipment, who are spread over a broad geographic area in the western United States. The account team also saw significant value in this

because, as the Xerox business services manager put it, “When you’re dealing with 400 end-users there’s no way that you can touch every one of them every day.” The equipment contract was renewed in 2003 and Sentinel was installed in one of the centers at the same time to see if the system could provide the desired end user communication capability.

Installation of the Sentinel system paid off for both Xerox and the customer almost immediately. When the first check-in messages were sent, several end-users replied that when the contract was renewed, their request to their management for upgraded equipment productivity options had not been filled. The Xerox account team was able to respond immediately, helping the end-users to make an appropriate request for the needed equipment that was quickly approved by their management. The result, a win-win...the users were satisfied because they got the productivity equipment they needed so quickly, the decision maker was pleased with the quick response that was prompted by Sentinel, and Xerox received incremental revenue from supplying the upgraded equipment.

Based on the early feedback from this test installation, Sentinel was quickly made available to end users and administrators in the remaining medical centers in this division. Both Xerox and customer administrators have found the most valuable benefit of Sentinel’s use to be the instant feedback from end users and immediate response to that feedback on the part of Xerox. Xerox is able to understand and respond quickly to a user’s need because the communication from the user goes directly to the Xerox person who can best deal it. Customer purchase decision makers can now know what end users throughout the division need at any given moment and, more important, know that there is now a process in place that assures and tracks the Xerox response to those needs.

In fact, customer decision makers got a dramatic example of just how well Sentinel can deliver shortly after the system was installed. A customer contract administrator used Sentinel to communicate that a Xerox policy in place was a barrier to contract upgrades or changes. The Xerox business services manager notes that, “...the account sales team couldn’t resolve that, but through the Sentinel escalation process the issue pretty quickly got up to the top of Xerox marketing. They removed the barrier not just for our account, but across the whole company. When our contact heard that all she could say was, ‘Wow...this is really working!’”

Technology Manufacturer

Under a managed services contract, Xerox is the sole provider of document management products and services for this multi-division manufacturer of

engineered and high technology products for consumer, commercial and defense applications. For this customer, Xerox provides in the United States:

- Several thousand units of document management equipment at 450 locations on a fleet management service basis
- Document production and graphic services at 12 major production centers
- Mailroom services

Under this managed services contract, Xerox is responsible to end users for tens of thousands of individual jobs involving hundreds of millions of pages per year. A major challenge that Xerox faced was to ensure that it was in compliance with negotiated performance commitments in the managed services contract, especially the service level agreements on job quality and turnaround time Xerox had committed to in the production facilities. To obtain customer feedback on performance, Xerox used paper-based surveys that asked customers to check boxes rating performance quality on criteria such as document quality, turnaround time, equipment availability, equipment service response time and so on. But, over time, response to these surveys suffered and Xerox account management knew it had to find a replacement method of gathering user satisfaction or problem resolution information or lose the ability to certify performance levels to customer purchase decision makers and senior management—the outcome of which could have been loss of part or all of the customer's business. As the Xerox global account general manager puts it, "Over time these surveys become pretty repetitive and, while the customers always felt bad about throwing them away, they'd tell us 'How many times can I tell you that you did a good job and everything's fine.' We knew we were doing a good job, but didn't have a good way to prove that."

After a brief test at the end of 2003, Sentinel was installed throughout this account in January 2004 to address this issue. Positive results were almost immediately apparent. End users were happy to be able to tell Xerox they were satisfied with a job or its performance just by deleting an e-mail, saving them time and trouble. But the real surprise for Xerox was when they found how many customer users provided positive comments on the quality of Xerox services. At a performance review with senior customer executives in mid-2004, the Xerox global account general manager was able to show 34 pages of positive verbatim end user comments from facilities across the country about the customer orientation and good performance of Xerox production center people. "It was clear to the customer that we were doing a good job," observed Xerox's account manager. "Before this, the customer and I had no idea how passionate their people were about our service."

Besides providing objective evidence that Xerox is meeting its service level commitments, Sentinel allows Xerox people to maintain that high level of performance by providing them the information to quickly correct problems before they become serious performance issues. Xerox account managers appreciate the effectiveness of Sentinel's real time, closed-loop problem resolution and tracking process in helping them quickly deal with developing problems. "We can actually time how quickly we can fix a problem when one occurs," say Xerox account managers. The account team is planning to expand use of Sentinel even further, addressing potential applications in job billing and help desk services among others.

FUTURE DEVELOPMENT

Xerox's use of Sentinel today is in its infancy. The first two years have been spent in development of the basic customer satisfaction assurance system by XBRG, filing of patent applications, a rigorous beta test in a national customer organization, and initial deployment to the first large customer and internal Xerox organizations. Sentinel's next step will be completion of deployment to Xerox's largest accounts in the United States, Canada, Europe, Latin America, and elsewhere. Xerox management is strongly supporting this expansion and the XBRG expects that it will be mostly completed in 2005.

But what started as a customer satisfaction measurement tool could, ultimately, cause Xerox to rethink the way it delivers customer service. Future versions of the system could integrate knowledge management tools, such as data mining, linguistic analysis, text categorization, and pattern recognition capabilities under development by Xerox Research Centre Europe and others, to continuously monitor and learn from customer problems.

This would build a knowledge base of problems and solutions that could enable Sentinel to communicate directly to customers, suggesting solutions or short-circuiting the development of potential problems in a customer organization. These tools could also comb the content of compliments and comments received to provide Xerox customer support organizations with knowledge about "best practices" most appreciated by customers. These could be built into new corporate-wide programs to improve customer value and satisfaction. Knowledge gleaned from these compliments and comments could also provide powerful input to marketing and strategic communication programs to improve customer awareness and attitudes toward Xerox. Finally, customers are already providing a wealth of comments about unmet needs for document and information

management products and services. Advanced knowledge management tools could combine this data with data collected on problems to guide Xerox business strategy, new product and service development planning, and rapid prototyping and promotion of new offerings.

CONCLUSION

What started as a search for reasons why Xerox customer satisfaction data were not assuring customer loyalty or explaining defections from Xerox, has gone well beyond that, creating a model for customer relationships that is making Xerox both more agile and more adaptable in serving customers. The work that led to the development of Sentinel has provided plausible reasons why many customers defect: the lack of quick identification and appropriate solution of all problems customer end users may have. Conventional customer satisfaction measurement cannot address this lack; it took the development of an innovative new solution, Sentinel, to do that.

But according to Stephan Haeckel, Sentinel is really a true sense-and-respond system—a customer-back, role and accountability structure for action. Haeckel thinks it's much more than a great marketing idea, he believes Sentinel is a way for Xerox and its customers to co-create new value. And, in his mind, that's the real definition of adaptability.

Haeckel thinks that the real test of Sentinel is three or four years down the road. Will it become the way that Xerox relates with all its customers? The early use of this system by Xerox already shows great promise. But in the future, the greatest benefit of Sentinel to both customers and Xerox may be the organizational and structural change produced by new generations of the system that provide for now unimagined improvements in creation of customer value.

10

IMPLEMENTING THE AGILE ENTERPRISE



The E-Business Opportunity Model

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EXECUTIVE OVERVIEW

Established organizations continue to struggle with how to evaluate the potential of applying Internet Technologies to create competitive advantage and implement the concept of an agile enterprise. The examples and insights presented by obvious Internet success stories such as Amazon.com do not easily apply or leverage the strengths (and weaknesses) of established firms and industries. The E-Business

Opportunity Model (EOM) and its associated E-Business Opportunity Index (EOI) described in this article provides managers with an easy to apply and comprehensive tool for analyzing an industry and targeting areas of opportunity to implement the agile enterprise. The EOM integrates multiple perspectives into a set of fifteen factors that are grouped into context, product, and transactional categories. The factors comprise the heart of the model and index and are used to assess the potential of applying Internet technologies. The article also includes two examples of applying the EOM to the pharmaceutical manufacturing and life insurance industries. The results provide interesting insights into the fundamental structure of each industry as well as more generic conclusions that may apply across different industries.

UNDERSTANDING THE POTENTIAL OF E-BUSINESS TECHNOLOGIES

The use of information technology in business strategy to leverage opportunities and to transform business has increased in importance over the past several years as firms strive for competitive advantage in a diverse and changing marketplace. E-business is the use of Internet technologies to improve and transform key business processes. (IBM e-Business) Despite the recent slowdown in venture capital funding, the opportunities presented by e-business continue to expand beyond the capabilities that most experts have to fully comprehend them.

Many can explain in great depth the simple business-to-consumer transactional models of book selling or airline ticket reservation. However, what we have already learned about the success and failure of e-businesses suggests that the best opportunities exist in more flexible and advanced “second generation” business strategies, represented by diverse applications such as shopping “bots,” online auctions, and Internet-based business-to-business exchanges. Indeed, the long term economic value of e-business may lie less in the single-purpose “dot-com” than in the more traditional line manufacturer who can create opportunity by leveraging core strengths. From this perspective, e-business is viewed as an opportunity to enhance the competitive capability of the firm.

In this paper, we develop an approach to evaluate e-business competitive capabilities. We build the E-business Opportunity Model (EOM), which draws upon concepts from multiple theoretical perspectives in both the organization and strategic management literature. Such an integrated approach is needed because existing models only explain portions of e-business potential and application. From this model we derive a tool, called the E-business Opportunity Index (EOI),

which can be used to measure and evaluate e-business potential. This tool allows managers to identify where e-business can provide opportunities to implement the agile enterprise. The index will help managers identify specific areas and resources to target for adaptation and/or innovation. (Pal and Lim 2005) *In other words, e-business as a concept is a tool to achieve agility, and our model and associated index, provides the underlying conceptual framework to identify areas in the organization where agility can be attained by applying the fit/adaptation approach and/or the innovative approach as outlined by Pal and Lim elsewhere in this book.* Finally, we present case studies from two industries, life insurance and pharmaceutical manufacturing, which demonstrate how the EOI can be used to measure how information technology can be leveraged to create agility. In addition to industry-specific analyses, we identify opportunities and challenges that are common to both industries. The application of the EOI to these two industries shows how e-business reduces barriers to entry and provides opportunities for increasing the efficiency of transactions. We also see how the complexity in government regulation and the lack of a sensory experience can be barriers to the implementation of an e-business strategy.

BUILDING THE E-BUSINESS OPPORTUNITY MODEL

Given that the focus of our work is on identifying opportunities, it is simpler for the manager and analyst to think in terms of issues related to product, the context, and the transaction. These three categories represent key areas for identifying opportunities for leveraging E-business technologies. Examining the *product* offers opportunities for infusing information and increasing efficiency and effectiveness in production and distribution. Considering the *context* can reveal opportunities to exploit its environment (or market) and its constraints. Regarding the *transaction*, opportunities may exist for dramatically increasing the efficiency of moving the product, or leveraging information in order to personalize the customer experience.

These categories (and the factors which comprise them) are the basic building blocks of the E-business Opportunity Model (EOM). Although the categories are logical, they are not meant to limit thinking. For example, the most interesting analysis may depend on combining factors from several categories. The model presented in Figure 1 describes the relationships between contextual, product, and transactional opportunities in an industry and their effect on the overall e-business opportunity in that industry. The figure also illustrates the model's multilayered nature—each area of opportunity can be viewed from the customer, supplier, and processes perspectives.

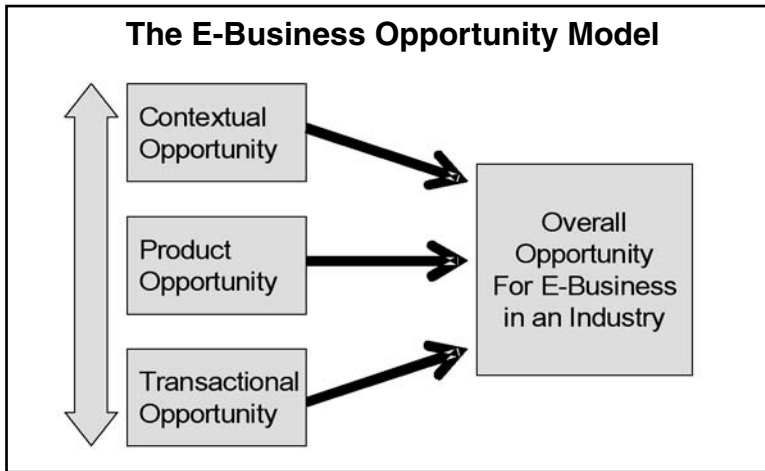


Figure 1. The E-Business Opportunity Model

Contextual Opportunity Factors

Factors Related to Markets

One common, comprehensive strategic perspective that addresses market evaluation and selection is Porter's Five Forces Model. (Porter 1980) This model describes the competitive structure of an industry as a function of the threat of new entrants to the market, the intensity of rivalry among incumbents, the threat of substitute products or services, and the bargaining power of buyers and suppliers (Figure 2). The existence and the potency of these forces determine the degree of competition, which in turn determines the opportunity to profit in an industry.

For example, *high capital requirements*, *extensive regulation*, and *culture* are major barriers to entry in many industries. High capital requirements may limit e-business potential because of the financial constraints in adopting new strategies. On the other hand, while it may be difficult to leverage e-business potential in a highly regulated industry, there may also be an opportunity if e-business improves regulatory responsiveness. High cultural or regional specificity may lower e-business potential. With respect to *competitive form and intensity*, and substitute availability, if the competitive structure is such that new products or services threaten existing ones, then e-business potential is higher. Finally, powerful buyers or suppliers suggest a high level of *partner dependence* that may reduce e-business potential unless it provides the potential to connect with or out-manuever partners.

In addition, *organizational compatibility* is also a concern with respect to human resources. The culture of the organization, communicated by management style, mission and values, can either be either a conduit or a barrier to e-business potential.

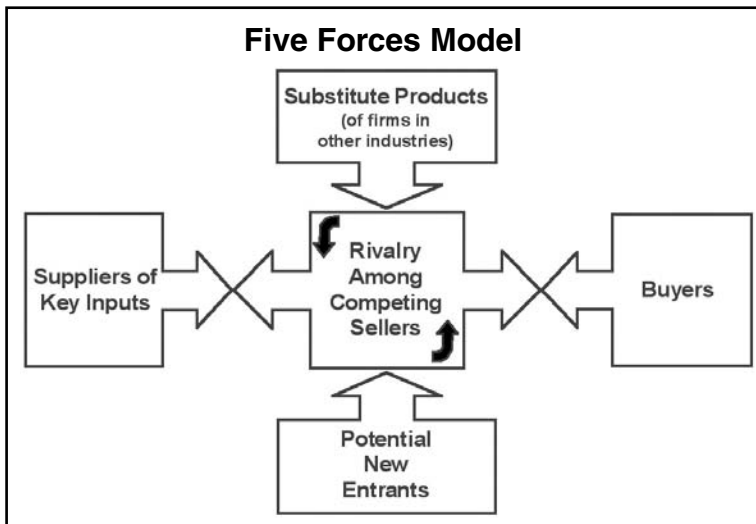


Figure 2. The Five Forces Model

Product Opportunity Factors

Factors Related to Core Competencies

For most organizations the main contribution of e-business to business strategy may be to enhance distinctive competencies in the marketplace, thereby increasing the value of that business' products or services. Prahalad and Hamel (1990) provide three tests to identify core strategic competencies. First, a core competence provides potential access to a wide variety of markets. Second, a core competence makes a significant contribution to the consumer's perceived benefits of the end product. Depending on the nature of the perceived benefit, e-business can be an enabler or an inhibitor. For example, if one of a firm's core competencies is its high level of personalized customer service, the success of an e-business strategy would depend on its ability to enhance (or at least not inhibit) the current level of service. Finally, a core competence should be difficult for competitors to imitate. This suggests that the potential for e-business to enhance distinctive competencies may depend on the features of the product or service that provide the basis for distinction.

The three tests can be applied to an examination of issues relevant to e-business. E-business potential is higher for products with high *brand equity* because it is easier to establish recognition as an on-line presence. From another perspective, *production complexity* is also important because the manufacturing process may reflect a core competency. High production complexity can result in lower e-business potential since the product may be difficult to service remotely.

However, high *information intensity* implies a high e-business potential since it can be used to simplify, structure, and manipulate information, or create high switching costs through customer relationship management.

FACTORS RELATED TO THE CUSTOMER EXPERIENCE

Ives and Mason’s (1990) customer service lifecycle model (or CSLC, see Figure 3) provides another lens to view the key opportunity aspects of e-business investments. The model emphasizes the “customer-facing” portion of the business by analyzing the steps a customer will take in purchasing and using a product or service. The cycle is divided into four phases: requirements, acquisition, ownership, and retirement. The requirements phase addresses establishing a need for the product, while the acquisitions phase addresses the actual purchase process. In the ownership phase, the consumer uses the purchased product and anticipates and plans for any future changes. Finally, the retirement phase marks the end of the product’s life cycle.

Brand equity, *emotive content*, *sensory impact*, and *information intensity* are all product-related attributes that follow directly from the “requirements” phase of the CSLC. Transactional factors (described further in the next section) such as *frequency*, *complexity*, and *logistical flexibility* follow from the “acquisition”

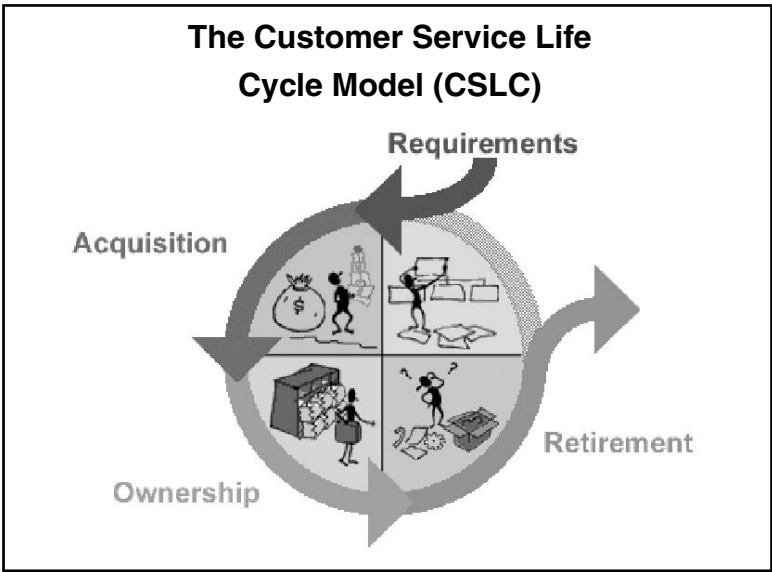


Figure 3. The CSLC Model (Ives and Mason 1990)

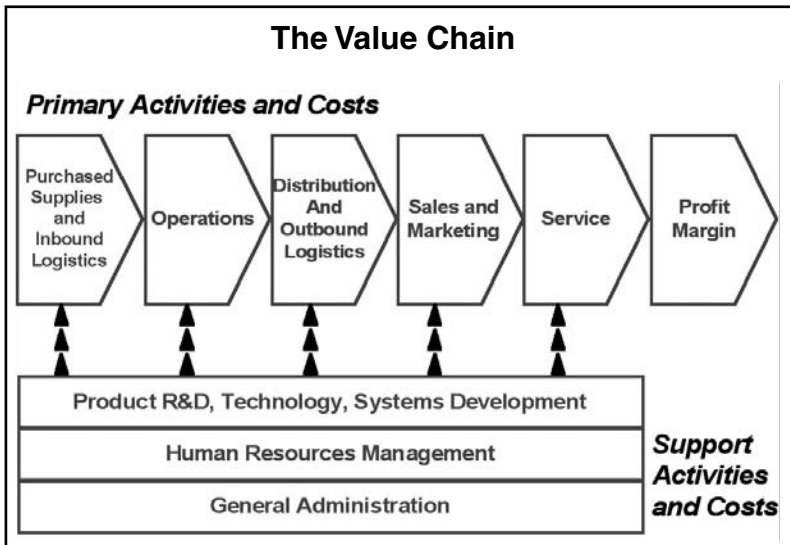


Figure 4. The Value Chain

phase. High *emotive content* could result in lower e-business potential because of the impersonal nature of the Internet, unless there is a way to leverage emotive content to reach out to a particular market segment. Similarly, products with a high *sensory impact* may have lower e-business potential since the tactile aspects of a product are difficult to convey on-line.

Another framework for assessing contribution to customer value is value chain analysis (Figure 4). A value chain analysis allows for the evaluation of the contribution of individual business activities to the overall level of customer value. (Rayport and Sviokla 1995) Here, appropriate strategic alignment between “off-line” business and “on-line” e-business strategies could add value through process improvement. This heightened understanding of individual processes helps identify where e-business technologies create additional value, targeting “low-value” processes for enhancement. *Logistical flexibility*, *production complexity*, and *transaction complexity*, factors that have been previously discussed, also are indicators of those low value processes. For example, processes with low flexibility and high complexity are candidates for automation through the use of e-business technologies.

Transactional Opportunity Factors

Factors Related to Transaction Costs

Also important to the value of an e-business investment is to look at its cost implications. For this, transaction cost economics (TCE) can provide some

guidance. A fundamental principle of TCE theory is that organizations incur costs as a result of planning, implementing, and enforcing exchanges with other organizations, and structure these exchanges in ways that will minimize these costs. Those contractual relationships arise from efficiency-seeking behavior in a world of limited information and incomplete enforcement possibilities. (Oster 1990) From this perspective, the economic opportunity presented by e-business resides in its ability to reduce transaction costs associated with both internal and external exchange, by increasing the productivity of the existing transaction-processing infrastructure. Characteristics of transactions that increase transactions costs include *frequency* and *complexity*. For example, in complex transactions, e-business has the potential to simplify and streamline business processes. The inherent *value* of an individual transaction is important when assessing its associated costs. Transactions with a high value could more easily absorb higher costs (incurred due to a higher level of complexity or frequency). Of course, the automation of high value, low cost transactions through e-business technologies would be highly preferable.

In addition, the existence of asset specificity (the degree to which assets can be employed for uses outside the specific transaction) and bounded rationality (limitations on the information capacity of either partner in the transaction) increase transaction costs. Higher *logistical flexibility* (which leads to lower asset specificity) can result in higher e-business potential because it implies location independence. *High information interoperability* (which leads to lower bounded rationality) translates into higher e-business potential since it implies a relationship well-suited to the exchange of structured information.

OPERATIONALIZING THE EOM AS THE EOI

The fifteen factors introduced in the previous section can be grouped into context, product, and transaction categories. The context category includes the collection of market related factors. Product factors reflect the characteristics of the product or service under consideration. Finally, transaction factors reflect characteristics of the exchanges occurring at any point in the firm's value chain. Combining these factors with the model described in Figure 1 results in the full E-Business Opportunity Model (Figure 5).

From the E-Business Opportunity Model, we derive an index that provides a method of quantifying the level of opportunity that exists in an industry. An index is useful because it focuses the analysis by requiring the analyst to assign numerical ratings and weights. A score is computed by rating each of the individual factors

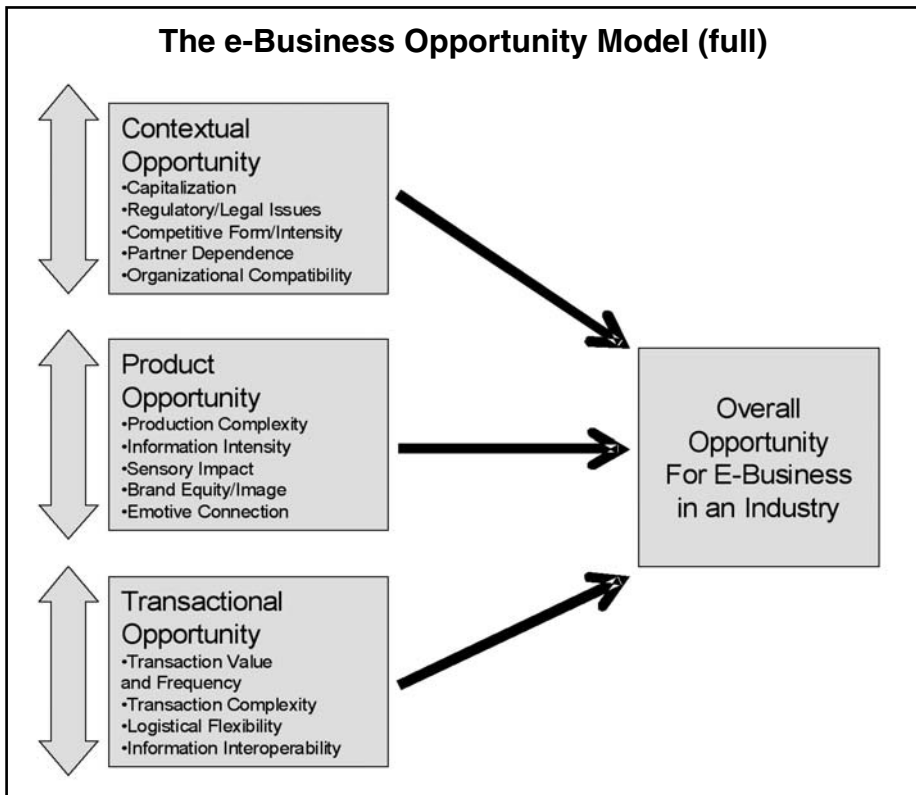


Figure 5. The E-Business Opportunity Model

and looking at the aggregate value for each category (contextual, product, and transactional). The resulting tool is the E-Business Opportunity Index (EOI). A simple spreadsheet tool is used to perform the analysis (see Figure 6). Each factor is listed and then followed by a description and brief analysis of its implication for e-business. A detailed analysis of the factor from the perspective of customers, business processes, and suppliers is the basis for assigning values for e-business potential and importance. The results of the above process will help the manager decide which factors are appropriate and ready for agility enhancement through the application of strategic alignment processes and/or radical innovation, and which factors are already reflective of high agility.

Each factor in the EOI is rated on two scales. The first reflects the e-business *potential* and has a value from 1 to 5 (Very Low to Very High). The *potential* scale addresses the specific E-business feasibility of a factor and consists of the integration of two elements: The general business potential of the factor and the information technology potential. The second scale reflects the *importance* of that

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Figure 6. Spreadsheet Tool for the E-Business Opportunity Index (EOI)

factor, and also has a value from 1 to 5 (Very Low to Very High). The *importance* scale provides a mechanism to assign relative weights to the factors within a particular industry. The scores for potential and importance are multiplied together to arrive at an overall score (from 0 to 25) for that factor. The entire EOI spreadsheet showing a calculation for scoring the opportunity factors is provided in the Appendix.

ASSIGNING WEIGHTS TO THE FACTORS (THE “ IMPORTANCE” SCALE)

A two-phase process was used in the assignment of factor weights. First, the authors researched representative industries (Life Insurance and Pharmaceutical Manufacturing) in order to gather the baseline data needed to complete the EOI. Industry experts associated with a major consulting firm then validated the accuracy of our application of the information to the EOI. The EOI was

revised as needed based on their input. The authors then assigned initial weights based on the EOI. The industry experts were then asked to validate the weights, and adjustments were made. We then aggregated the weighted score to arrive at a single index value measuring e-business potential by dividing the sum of the factor scores by the maximum possible score for that category (i.e., using “25” for each factor score). The resulting ratio therefore ranges from 0 (no e-business potential) to 1 (certain e-business potential). The following case studies illustrate the application of the EOI in two representative industries, life insurance and pharmaceutical manufacturing.

Application of the EOI: Life Insurance and Pharmaceutical Manufacturing

Life Insurance Industry

While other sectors of the financial services industry have made significant strides in performing online transactions and automating customer service functions, the insurance industry has been relatively slow to pursue this medium aggressively. According to an IVANS study (2001), online insurance sales are estimated to be less than one percent of the \$420 billion insurance market. An article by Carr, et al. (2000) studied the use of information technology in life insurance distribution and found that insurers that performed more functions online were more efficient than those that did not. Many disjointed information systems are currently in use by the insurance industry, making business-to-business transactions inefficient and difficult. Consequently, the handling of claims is often inconsistent and without verification. The above scenario presents a significant opportunity for firms in the insurance industry. Resolving inefficiencies in operations is not only important to controlling costs for the major carriers, but also for providing the customer with better, more consistent service.

Pharmaceutical Manufacturing Industry

Investments in e-business by the pharmaceutical manufacturing industry are second only to those of venture capitalists. (Kleinke 2000) Potential opportunities in e-business are already driving major strategic decisions. For example, the Wall Street Journal reported that one of the specific goals of the Glaxo Wellcome merger with SmithKline Beecham was to exploit opportunities to more aggressively pursue use of the Internet for direct to consumer advertising. (Waldholz and Moore 2000) Given the irreversibility of these investments, it is critically important that industry participants have mechanisms that allow them to analyze strategic initiatives and maximize opportunities that increase the likelihood of success.

INDUSTRY ANALYSIS: LIFE INSURANCE

The result of applying the EOI to the life insurance industry indicates a moderate opportunity for the application of e-business. The overall EOI ratio of 0.51 suggests that although opportunity exists, there are significant obstacles. An interesting insight is found by comparing the transactional category value of 0.66 with the product (0.54) and contextual categories (0.38). This suggests that the most significant opportunities can be realized through increases in efficiencies in transactions with the customer, while the structure of the industry and the product itself present fewer opportunities. These opportunities are discussed further below.

Contextual Factors (EOI Score: 0.38): The highest scores in this category were given to Partner Dependence (16) and Cultural/Regional Specificity (12). This highlights two important implications for e-business. First, the exchange of information between partners, specifically agents and carriers, is essential for customer relationship management in this industry. Streamlining this exchange of information has the potential to result in a significant reduction in overhead. Companies that effectively employ e-business in this area have the opportunity to turn information exchange and customer management into a core competence. Second, life insurance is a product that can find a potential market in all industrialized societies. Therefore, although regional customization may be necessary (with regard to language, culture, and regulations), the underlying product fundamentals remain the same. This presents an opportunity to leverage the global reach of the Internet to sell policies internationally.

Lowest scores in this category were assigned to Competitive Form/Intensity (6) and Organization Compatibility (6). This reflects the fundamental inertia in the industry, which is dominated by a few, large firms with a complex, existing infrastructure. These characteristics are likely to inhibit change, specifically the transformation required by an e-business effort.

Product Factors (EOI Score: 0.54): The highest scores in this category were given to Brand Equity/Image (20), Information Intensity (16), and Sensory Impact (15). Because of the dominance of large, established firms, it is possible for carriers to leverage their brand recognition when launching an online presence. Additionally, an insurance policy is a largely information-based product, which makes it possible for a carrier's e-business presence to deliver most (or all) of their product to the customer online.

Another strong indication of the opportunity for e-business exists in the life insurance product's lack of reliance on a sensory experience. One consequence

of a policy being information-based is that a tactile, auditory, or visual customer experience is not necessary. Therefore this facilitates the sale, delivery, and maintenance of the product through an Internet channel.

The lowest score in the Product category was given to Emotive Connection (4). The strong emotional component associated with the sale and maintenance of a life insurance policy is extremely difficult to conduct through the online channel. The combination of its importance and its difficulty to implement present a significant barrier to e-business for this industry.

Transactional Factors (EOI Score: 0.66): Transaction Complexity and Information Interoperability received the highest scores in this category (both 20), reflecting the strong informational component of the life insurance product. The need to transmit and exchange this information among agents, carriers, and customers, makes the sale, delivery, and maintenance of a policy extremely complex. E-business connectivity among partners, as well as the establishment of an online presence for customers, presents tangible opportunities to reduce this complexity. This can take the form of a simpler customer experience, the simplification of business processes along the value chain, and automation through “B2B” e-business systems.

The existing “legacy” infrastructure of the large carriers presents a significant opportunity for e-business through the facilitation of information interoperability. As standards emerge and are adopted, the need for manual systems or complex EDI interfaces will become unnecessary, reducing transaction costs and improving customer service.

The lowest score in this category was given to Logistical Flexibility (10). Regulation of the insurance industry varies from state to state. Although a carrier, through an online presence, could easily reach its customers domestically and internationally, the movement of customers between states and the licensing process creates legal issues which e-business systems alone cannot resolve.

INDUSTRY ANALYSIS: PHARMACEUTICAL MANUFACTURING

Application of the EOI model to the pharmaceutical manufacturing industry indicates a moderate level of opportunity for E-business. The overall EOI ratio of .50 suggests that although opportunities exist, they may be confined to defined areas of activity where the payoff will be sizable. Results for contextual, product and transactional factor categories are summarized below.

Contextual Factors (EOI Score = .50): The highest scores in this category were for capitalization (20), the form and intensity of competition (15), and partner dependence (16). The high costs of capital associated with R&D and marketing pose major barriers to entry into pharmaceutical manufacturing, placing smaller firms at a disadvantage. If E-business applications reduce the costs associated with conducting business, these barriers can be lowered.

Similarly, competition in this industry is based on the ability to get to the market with patentable “breakthrough” drugs. First mover advantages are huge, since once a patient begins an acceptable treatment regimen, there is little incentive to switch to a substitute on the part of either the patient or the physician. This is another opportunity for smaller firms to be competitive through lowered costs. The relationships between the big pharmaceutical firms and some of their distribution partners threaten to commoditize this industry. E-business, by enabling direct to consumer marketing, may allow manufacturers to by-pass these distribution partners, particularly managed care channels.

On the other hand, while regulation is a very important feature of this industry, the potential for expediting the regulatory process is unclear, generating a relatively low score (10). While manufacturing and R&D are highly globalized, most of the opportunities for globalization have already been achieved, generating the low score of 6 for this factor.

Product Factors (EOI Score = .46): While this category received the lowest score overall, some individual factors were found to have high impact. Highest scores in this category were for emotive connection (20), information intensity (16), and brand equity/image (16). While consumers are highly invested in matters of personal health, they are frustrated by the complexity of the information seeking process. As indicated by the number of consumers attempting to access information on the web, the Internet has already gained acceptance as an information source. Becoming the “preferred provider” for this information gives pharmaceutical manufacturers the opportunity to improve compliance, promote brand recognition, and potentially reduce errors attributable to drug interactions. In this regard, the formation of on-line therapeutic communities has been particularly effective. However, given the low complexity of the production process and the lack of sensory impact associated with the product itself, these factors received relatively low scores (4 and 1, respectively).

Transactional Factors (EOI Score = .58): Most of the weight in this category is carried by a single, high impact factor - Information Interoperability - with the highest possible rating (25). Information standards have been mandated in virtually all areas of healthcare, and pharmaceutical companies are well positioned

to be at the forefront of these developments. Within the industry, uniform standards for supplier specifications are already in place.

While the other factors (Transaction Value and Frequency (12), Transaction Complexity (12), and Logistical Flexibility (9)), are of moderate importance, the potential for e-business is not as high. For example, unless restricted by conditions of their health care insurance plan, consumers can go to virtually any drugstore to fill prescriptions and it is not clear what advantage e-business would offer over any mail-in service. Because most inputs into the production process are commodities, there is considerable logistical flexibility with respect to procurement.

COMMON E-BUSINESS OPPORTUNITIES ACROSS INDUSTRIES

As stated previously, the analysis resulting from the EOI (and the EOM) also reveal common opportunities across industries, providing some general guidelines for gauging the potential success of an E-business initiative. By comparing the results of the EOI analysis for the life insurance and pharmaceutical industries, we can identify these common opportunities for the use of E-business. It appears that two significant ones exist. First, E-business can be used to transform the nature of competition by reducing barriers to entry. Second, using electronic linkages can create efficiencies through increased transfer of information between stakeholders.

Opportunity 1: Reducing Barriers to Entry

The EOI analysis indicates that the automational, analytical, and geographical power of IT can be used to significantly increase information sharing among small to mid-size life insurance carriers. This can be done by significantly reducing transaction complexity and increasing information interoperability. Such information sharing could lead to new efficiencies and new opportunities for smaller firms to more effectively compete against the prevailing larger firms. A key barrier is the lack of standards for implementing information sharing. The Internet could represent an opportunity for independent agents to compete with affiliated agents by creating an identity based more on their own service than the quality of their affiliated carrier. Such a change, if successful, would represent a

new breakthrough business model concept for creating the agile enterprise. In the pharmaceutical manufacturing industry, the potential for e-business to change the structural characteristics of competition are significant. Lowering capital costs will allow new and more diverse competitors to enter the market. The potential to bypass powerful managed care distribution channels through direct to consumer advertising may prevent (or at the very least delay) the commoditization of pharmaceutical products.

Opportunity 2: Increase Efficiency in the Transfer of Information

Not only does increased interoperability increase the ability of smaller firms to enter the market and compete, but E-business also offers companies the ability to improve the efficiency of their operations through automation, an example of seeking agility through incremental and continuous changes. This opportunity is particularly significant in industries with a high level of information intensity, such as life insurance and pharmaceutical manufacturing. Figures 8 and 9 illustrate this point by showing each industry's physical and virtual value chain, highlighting opportunities for improving efficiency in the transfer of information.

The reduced complexity of the insurance transaction can potentially reduce the insurance carriers' dependency on partners, specifically the role of agents. The Internet can be used to create interaction directly between customers and carriers or to augment the productivity of agents. This could be done through the development of a portal site that includes information about life insurance and overall quality-of-life issues, along with an online mechanism to access personal account information. This type of site could be used for the dissemination of product information via a carrier's Internet presence. This is currently seen on some sites in a relatively subtle form through the implementation of "wage calculator" tools.

Like the life insurance industry, pharmaceutical manufacturing is an information intensive industry. There are opportunities across the entire value chain to transfer information electronically. Information relevant to this industry involves both information generated by the customer (personal information), as well as information generated by the company (product and logistical information). Establishing standards for how this information is gathered and distributed, particularly with respect to privacy issues, may ultimately determine the value of e-business in the pharmaceutical industry.

Online communities are another important way that brand awareness can be established and information can be shared with customers. The formation

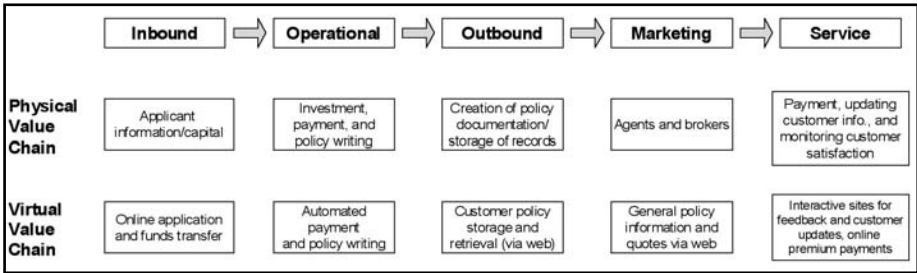


Figure 8. Value Chain for the Life Insurance Industry

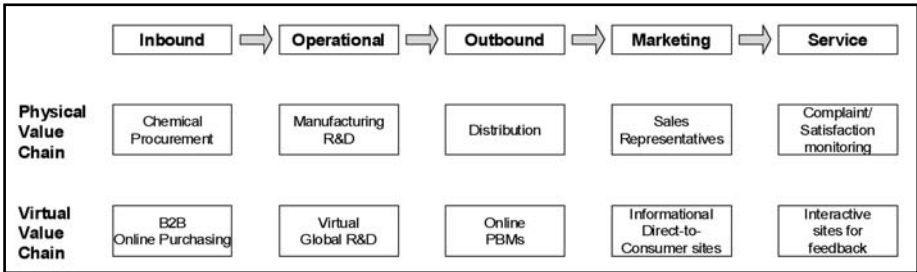


Figure 9. Value Chain for Pharmaceutical Manufacturing Industry

of on-line therapeutic communities has been particularly effective in increasing treatment compliance, brand recognition and loyalty. If the information is valid and objective, there are clear advantages for both consumers and manufacturers.

COMMON E-BUSINESS CHALLENGES ACROSS INDUSTRIES

In searching for common opportunities for e-business across industries, the analysis resulting from the use of the EOI also highlights two important challenges. These challenges involve the complexities of governmental regulation and the inherent limitations of e-business in delivering a sensory experience. The challenges in other words are also barriers to creating a truly agile enterprise.

Challenge 1: Regulatory Issues Across Geopolitical Boundaries

Both the life insurance and pharmaceutical industries are heavily regulated industries in the countries in which they operate. However, as can be expected, the level and nature of the regulation varies widely depending on the country in which the company is operating. In the case of the United States, regulatory issues

vary within the country, depending on the state. These regulatory differences necessarily have implications for developing uniform standards for the exchange of information across an entire industry. Therefore, methods to facilitate information exchange will have to be developed. This can be done through technical means, like XML-based messaging, or through regulatory means, such as the implementation of the HIPAA-related standards that govern the privacy of information related to health insurance and pharmaceutical prescription information.

Challenge 2: Dealing with Low Sensory Impact Products

We generally viewed products with low sensory impact as advantageous for e-business. This is because the online channel's reduced ability to convey a sensory experience would affect these products the least. However, this also underscores a significant limitation that still exists with an E-business strategy. Despite increasing multimedia capability and interactivity, an online presence is still not often an adequate substitute for "live" interaction. As stated earlier, even the life insurance and pharmaceutical manufacturing cases involve some attempt to include interactivity into their online presence, either through the insurance sites' wage calculators or the pharmaceutical industry's online communities. For products with a higher sensory impact, the ability to replicate the in-store experience is even more critical.

DRAWING LESSONS FROM THE E-BUSINESS OPPORTUNITY MODEL

In this paper we presented a model for the evaluation of industry-specific e-business opportunities, the EOM, and derived from it an analytical tool, the EOI, that can be applied to assess industry-specific e-business opportunities that can lead to a more agile enterprise. The EOM provides an integrative framework, informed by theory, for analyzing e-business potential across an industry. For practitioners, specifically analysts, the EOI provides a "big picture" look at how e-business can benefit an industry that can be readily communicated to decision-makers within an organization.

To facilitate such an analysis, Table 1 shows an overview assessment of all the dimensions of the EOI, and general implications of different ratings (broadly defined

Context	Product	Transaction	Assessment (Role of Internet Technology)	Example
Low	Low	Low	Internet technology will likely not provide competitive advantage unless one of the factors can be dramatically changed.	
Low	Low	High	Internet technology can be used to dramatically increase efficiency and/or convenience, leading to lower costs, which may in turn lead to new customers, new markets, and increased volume.	Example: Pharmaceutical Manufacturing
Low	High	Low	Internet technology can be used to enrich the product for differentiation, and to change how a product is marketed and sold.	
High	Low	Low	Internet technology can be used to market to new areas (political and geographical); small firms will have lower barriers to entry.	
High	Low	High	Internet technology can be used to increase information available to customers and efficiency between suppliers. It may be feasible to create strong alliances among buyers and suppliers.	Example: Life Insurance
Low	High	High	Internet technology can be used to deliver high volume, information-rich products online. The organization will still be constrained by the local geopolitical or legal environment.	
High	High	Low	Internet technology can be used by large and small firms to market high-end products to specific consumer groups.	
High	High	High	The prototypical “dot-com” “pure-play” opportunity where for example, the transactional volume is high, the product is information rich, logistics are simple, and there are low capital requirements.	

Table 1: Assessing the Role of Internet Technology using the EOI

as “low” and “high”). Also highlighted is where our analyses of the life insurance and pharmaceutical manufacturing industries fall within these assessments. For example, the life insurance industry is a representative example of a firm with high contextual and transactional opportunity, but lower product opportunity. We assert that these firms will use Internet technology to both increase efficiency and the flow of information between buyers and suppliers. This is consistent with the analysis of this industry, where the information-intensive nature of the life insurance product can enable direct interaction with the customer with regard to the product’s delivery and maintenance. Furthermore, the notion that industries with high transactional opportunity but low contextual and product opportunity will primarily use Internet technology to increase efficiency is consistent with our assessment of the pharmaceutical manufacturing industry. Opportunity in this industry is seen to be greatest in the area of information interoperability, leveraging the existing industry standards for supplier specifications.

It is necessary to also recognize that the model has some limitations. Specifically, while the EOI provides a picture of the industry opportunities, it does not address the strengths and weaknesses that vary across individual companies. Before adopting an e-business strategy, it is essential to match organizational strengths and weaknesses to industry opportunities. Second, the scales are necessarily relative and subjective and should be treated as such. Also, the values for the scales are a snapshot based on the “state-of-the-industry” at that point in time. The appearance of new innovations, new regulations, competitors, and products could significantly change the analysis. The EOI should be considered part of an arsenal of tools that can be used to assess e-business potential and implement strategic agility.

Despite these limitations, the EOI reveals some interesting insights about the potential opportunities and challenges in the implementation of e-business. The EOM and EOI provide managers with a tool to practice open-ended processes of *strategic discovery* (Hamel 1996) needed to create the agile enterprise. We see through the case studies that e-business can potentially reduce barriers to entry and provide opportunities for increases in the efficiency of transactions. However, our analysis also reveals that the complexity of variations in government regulation and the lack of ability for e-business sites to deliver a sensory experience to customers can be barriers to the implementation of an e-business strategy. The identification of common opportunities and challenges across two very different industries shows that the concepts underlying the model are likely to be useful in other applications as well. Further studies may reveal additional commonalities that could in the future inform a comprehensive theory of e-business potential and success.

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APPENDIX: E-BUSINESS OPPORTUNITY INDEX (EOI) APPLICATIONS
(P = “Potential Rating” – I = “Importance Rating” – S = “Overall Score”)

LIFE INSURANCE EOI ANALYSIS

Factor	Description/Implication	Customer Perspective	Business Processes	Supplier Perspective	P	I	S
Contextual (external and internal) Factors							
Capitalization	How much capital is needed to compete? A high capital requirement implies a need for a large corporate infrastructure; a negative from the E-Business perspective. Less capitalization implies a business that is more easily adaptable to new strategies.	Given the potentially long relationship, customers will likely value firms that appear "solid" and have heavily invested in visible infrastructure such as property, or the thoroughness and quality of a website.	There is little capital needed to produce and operate life insurance options. The major requirement is to meet state and federal regulations for reserves (also see regulatory level). However, a certain capital investment may be necessary in order to secure consumer confidence.	Suppliers of reinsurance and the financial markets in general will prefer highly capitalized firms and vice versa	3	3	9
Regulatory Intensity and Legal Issues Potential	What is the extent of regulation on the product? It is difficult to leverage E-Business potential in a highly regulated industry, since regulations often vary across municipalities. However, the ability to respond quickly to new regulations may be an opportunity for competitive advantage.	Given the potential relative high value of policies, as well as the "faceless" nature of the Internet, customers will "feel" more secure when there is visible regulatory involvement.	E-Business Implication: Capital is needed but it is not critical There is a minimum amount of reserves required for each dollar of insurance provided. Through licensing, there is control over which people and firms and sell insurance. The licensing varies in each state thus creating a barrier to rapid geographic expansion. There is no specific legislation that prohibits the sale of insurance over the Internet, it is possible that regulation may appear in the future.	There are complex legal agreements that need to be drawn up to execute partnership agreements.	2	4	8

E-Business Implication: Regulation will get in the way

Cultural/ Regional Specificity	Is the product highly regional or specific to a particular cultural? A high cultural or regional specificity rating may result in a lower overall e-Business potential unless there was a way to apply globalization principles.	The image of solidity of certain national economies will help particular carriers. For example, a US, Japanese, German firm is more likely to be trusted by consumers. Different cultures place different values on obtaining and maintaining life insurance	The regulatory and legal issues become more complex when crossing regional and national boundaries. The same is true when it comes to marketing efforts and communication considerations.	4	3	12
E-Business Implication: Insurance is fundamentally a generic product needed by all industrialized societies						
Competitive Form/Intensity	What is the nature and intensity of competition that surrounds the product? If the competitive structure is such that new products and services can become a potential threat to existing ones, then e-Business potential is higher. If the competitive structure is such that customers are unresponsive to improvements in products or services, then e-Business potential is lower	Carriers compete to obtain brand loyalty from customers. There is significant rivalry among carriers though the competition is segmented by the customers they insure. Agents try to establish relationships with customers. Sole agents are assigned territories and compete only with local agents of other carriers. Independent agents are often in competition with each other.	Insurance firms are typically very apprehensive of the direct connection that agents have with customers. Therefore, a direct connection with their customers will be appealing. However, they need the agents to maintain the relationships.	2	3	6
E-Business Implication: Investment firms compete for the funds from insurance premiums, based on the best return on investment.						

E-Business Implication: There is not enough pressure to actually realize fundamental change, although differentiation is possible.

Partner Dependence	What is the extent of partner dependence? High partner dependence may reduce e-Business potential if it is difficult to connect with or get around partners.	Maintaining communication between agents and carriers is essential at the time of sale of the policy. It is also important after the sale, since the agent will serve as the primary point of contact.	Carriers and agents are dependent on each other. The agents are the point of contact for the customers and the carriers provide the policies for the agents to sell. The elimination or minimization of the role of agents has the potential to reduce overhead.	4	4	16
E-Business Implication: Changing the agent relationships holds quite a bit of promise						
Organizational Compatibility	Is the industry culture conducive to the fundamental changes required by an e-Business effort? A flexible adaptable industry will increase e-Business potential.	Customers are used to the insurance industry being dominated by a few large firms.	The IT knowledge of insurance industry veterans is generally low. There is a complex web of legacy systems that carry a large amount of inertia, making it difficult to make fundamental changes to the infrastructure.	2	3	6
E-Business Implication: Organizations and customers are not used to change in this industry.						
				Total	57	
				Minimum Possible	6	
				Maximum Possible	150	
				Ratio	0.38	

Product Factors

Production Complexity	Does the complexity of the production process or service make it difficult to produce and deliver? High complexity can result in a lower e-Business potential since the product may be more difficult to repair or service remotely.	Customers tend to seek help with obviously complex financial products, and thus may opt for a "real" agent when faced with the complexity of insurance policies. However, this inequality of knowledge between customers and agents can be equalized through the effective distribution of product information.	Rating tables and premium assessment is a complex process as well as deciding which market segments to focus on. However, these activities are very amenable to automation.	4	3	12
				It is relatively easy to combine the "raw materials" needed to create financial products such as life insurance		

Information Intensity	E-Business Implication: Producing insurance is a complex process, but IT can help.			
	What is the quantity of information embedded in the product or service? High information intensity implies a high e-Business potential since IT can be used to simplify, structure, and manipulate information. However, high information intensity could also provide an opportunity to create high switching costs through customer relationship management	The life insurance product is intangible and consists entirely of information. It is however hard for consumers to compare the information since it is not represented in a consistent format or language	There is a significant amount of information distributed and captured with each life insurance product	There is a significant amount of information associated with each life insurance product that is acquired from the re-insurance market
Sensory Impact	E-Business Implication: Insurance has very little sensory impact , making it a suitable product for e-Business.			
	What is the extent of tactile, aural or visual attributes in understanding this product or service? Products with a high sensory impact may have a lower e-Business potential since these aspects of the product may be difficult to convey online.	The product is a financial account with no sensory components. Visual representations may be used to simplify the representation of the product or to improve the marketing of the product	Without a sensory component, firms must rely more on external sources of validation (referrals and testimonials) and a strong customer relationship.	The business transactions here are essentially an exchange of information, and therefore unaffected by the non-sensory nature of the product.

Brand Equity/ Image	How well is the product, service, or industry known among its potential customers? Is it trusted? Is it easily recognizable? The e-Business potential is higher for products with high brand equity because it will be easier to establish an online presence.	The major insurance carriers have been in existence a long time and have a well known and trusted brand	Protecting and enhancing brand equity is very important to carriers – especially since they feel disconnected from the actual customers	Financial soundness is the key element here because suppliers are more likely to deal with established, stable firms.	5	4	20

E-Business Implication: Significant unrealized opportunity through leveraging brand image with new IT-based services.

Emotive Connection	Is there an emotional aspect to acquiring this product/service? A high emotive content could result in a lower e-Business potential because of the impersonality of IT. However, there may be an opportunity to leverage a particular emotion to reach out to particular segments of the market.	Life insurance can have a high emotive component given its role in retirement planning or the context of a claim. Agents play a significant role in "hand holding" clients	Policies and procedures need to remain sensitive to the emotive connection. There is the potential of legal claims and negative publicity because of this factor.	Re-insurers and other supply-chain members do not have the same customer-carrier relationship, and therefore little or no emotive connection.	1	4	4

E-Business Implication: Insurance is typically tied to major emotional life events which are not always compatible with E-Business

Total	67
Minimum Possible	5
Maximum Possible	125
Ratio	0.54

Transactional Factors				
Transaction Value and Frequency	What is the value of an individual transaction? How often does the transaction occur? High value and/or high frequency transactions in general are more attractive. However, it may be possible to use e-Business to create opportunities from low value and/or low frequency transactions.	The cost and the total value of policies is generally high relative to a customer's income. The frequency is generally low.	Firms have to deal with very high value transactions when claims are paid and in maintaining records and tracking premium payments	There is high frequency and high value exchanges among suppliers
			4	4
				16
E-Business Implication: Frequency can be increased through introduction of e-Services, creating high frequency, high value transactions.				
Transaction Complexity	How many steps are required to complete a transaction? Are the steps difficult to complete? Are they hard to understand? Complex transactions bring E-Business potential since IT can be used to simplify and streamline business processes.	A transaction is complex, involving many steps such as visits to agents, review of documents, visits to doctors, and so on. This issue has traditionally not been very important to customers as the "agent" provides a simplifying element. However, there is frequently a delay in response as agents need to continually "check" on issues with the carrier	Transactions are complex involving the collection of information, use of that information to determine rates and terms of the policy, the collection of health information, and the actual creation of a new account based on acceptance. Changes to the terms, collection of payments, and the payment of claims are also a complex process.	The compiling of compatible rate tables and premiums among firms is complex and involves complex negotiations to initiate a relationship. The complexity of specific transactions once the equivalencies are set up is low.
			5	4
				20
E-Business Implication: The complexity can be simplified through technology by establishing connectivity and standards.				

Logistical Flexibility	How easy is it to access or move the product or service across different locations? How easy is to bring in raw materials and parts into the firm? High logistical flexibility can result in good e-Business potential because it implies a high level of location-independence.	Although it is easy to physically move an insurance policy, customers may face a different set of state regulations if they relocate	The product has no physical component and is thus easily transportable on the paper it is printed. There are potential record keeping issues given the long life of some policies	There are no issues accessing the financial markets from multiple locations as long as the legal and regulatory issues are satisfied. Today's highly electronic financial markets are making this process easier	5	2	10

E-Business Implication: The product is relatively easy to "move" around

Information Interoperability	Can information be easily exchanged among the stakeholders? Are there any standards for the exchange of this information? High information interoperability translates into high e-Business potential since IT is well suited for the exchange of structured information.	It is hard to reuse information share such as application forms among potential carriers	There are few standards within firms and across the industry.	Currently firms use proprietary systems that are not interconnected or need complex EDI interfaces. The format of the information is not standardized and hard to exchange.	4	5	20

E-Business Implication: It is currently difficult to exchange information, but represents a potential application of IT.

Total	66
Minimum Possible	4
Maximum Possible	100

	Ratio	0.66
	Grand Total	190
	Minimum Possible	15
	Maximum Possible	375
	Ratio	0.51

PHARMACEUTICAL MANUFACTURING EOI ANALYSIS

Factor	Description/Implication	Customer Perspective	Business Processes	Supplier Perspective	Potential	Importance	Score

Contextual (external and internal) Factors							
Capitalization	How much capital is needed to compete? A high capital requirement implies a need for a large corporate infrastructure; a negative from the E-business perspective, unless there is potential to reduce capital costs	Customers would be unlikely to have much awareness of the capital expenditures associated with pharmaceutical manufacturing. Size of the firm probably does not translate into reputation	Capital requirements are significant for both R&D and marketing and pose a major barrier to entry. E-commerce applications may reduce costs	Suppliers of non-commodity items, such as clinical research organizations, have established a niche as pharma's outsource some capital-intensive functions such as clinical trials.	4	5	20

E-business implication: Reducing capital costs will make smaller firms more competitive

Regulatory Intensity and Legal Issues Potential	What is the extent of regulation on the product? It is difficult to leverage E-Business potential in a highly regulated industry, since regulations often vary across municipalities. However, the ability to respond quickly to new regulations may be an opportunity for competitive advantage.	Customers rely on government regulation to insure the safety and efficacy of pharmaceuticals, particularly for new introductions	Regulations govern all aspects of the value chain in this industry. Poor communications can delay the new drug introduction process, which could have serious consequences	Regulations imposed on pharmaceutical companies translate into demands for product specification adherence on the part of suppliers.	2	5	10

E-business implication: Anything expediting regulatory relationships would be a huge plus

Cultural/ Regional Specificity	Is the product highly regional or specific to a particular cultural? A high cultural or regional specificity rating may result in a lower overall e-Business potential unless there was a way to apply globalization principles.	Pharmaceuticals are necessarily standardized, although there may be some variations from one country to another. Pricing structure definitely varies.	Pharmaceutical companies are global with worldwide R&D and manufacturing facilities. Financing and distribution policies vary considerably from one country to another. Most globalization opportunities have been realized without e-commerce.	The global nature of this industry requires global supplier capabilities	2	3	6

E-business implication: Globalization facilitates use of e-commerce

Competitive Form/Intensity	What is the nature and intensity of competition that surrounds the product? If the competitive structure is such that new products and services can become a potential threat to existing ones, then e-Business potential is higher. If the competitive structure is such that customers are unresponsive to improvements in products or services, then e-Business potential is lower Once consumers begin a medication, switching costs are high. Direct to consumer advertising has been added to physician marketing in an effort to influence prescription decision Competition focuses on getting first to the market with the next breakthrough drug. Competition is intense because of the high cost associated with failure. Since for the most part these are commodities, competition among suppliers is intense. Pharmas are major buyers and can bargain for price concessions.	3	5	15
Partner Dependence	E-business implications: This is a high risk, high return but also highly regulated industry What is the extent of partner dependence? High partner dependence may reduce e-Business potential if it is difficult to connect with or get around partners. To get to the end user, it is essential for pharmas to get on the formularies of pharmaceutical benefit managers (PBMs) and hospitals. E-commerce may provide opportunities to bypass traditional distribution channels to access consumer directly. Pharmaceutical companies are developing their own PBMs to gain leverage over distribution channels. Partnering with suppliers on a long term basis could facilitate inventory management.	4	4	16
Organizational Compatibility	E-business implications: surmounting managed care distribution barriers What is the quality of the talent pool in the industry? Are industry veterans well-trained and flexible? Is the organizational culture flexible and receptive? A flexible and highly knowledgeable workforce will increase e-Business potential. There is an appreciation and high expectations on the part of consumers for what pharmaceutical technology can achieve. This is a technology-driven industry but the focus is on bench science and clinical trials. Pharmas were relatively late in recognizing IT potential For the most part, not much differentiation across suppliers of commodities. Suppliers are dependent on industry and will be responsive to e-commerce initiatives.	3	4	12

E-business implications: this is an industry receptive to technological change

Total 79
Minimum Possible 6
Maximum Possible 150
Ratio 0.5

Product Factors				
Production Complexity	Does the complexity of the production process or service make it difficult to produce and deliver? High complexity can result in a lower e-Business potential since the product may be more difficult to repair or service remotely.	While consumers may have concerns about side effects, etc; post-purchase, the physician acts as the service representative	The production process itself is low complexity. Other aspects of the value chain, such as R&D and marketing are considerably more complex.	For the most part, low production complexity
				2 2 4
Information Intensity	What is the quantity of information embedded in the product or service? High information intensity implies a high e-Business potential since IT can be used to simplify, structure, and manipulate information. However, high information intensity could also provide an opportunity to create high switching costs through customer relationship management	Customers have to understand indications, counter-indications, when to take the drug, how often to take it, how long to take it, what to take it with, what not to take it with, and precautions. Compliance can be a major issue both in terms of the information needed to be compliant as well as ensuring the compliance. Lack of compliance (unfilled prescriptions) is a source of lost revenue	Pharmas are responsible for conveying all relevant information to the prescribing physician and end-user. This is an information-intensive industry.	Information exchanged with suppliers is not high volume, but highly precise with respect to product specifications.
				4 4 16

E-business implications: Production process is not complex

E-business implications: High potential for creating more efficient and effective information channels

Sensory Impact	What is the extent of tactile, aural or visual attributes in understanding this product or service? Products with a high sensory impact may have a lower e-Business potential since these aspects of the product may be difficult to convey online.	The sensory impact is low, which is why the pharmaceutical agents themselves (pills, inhalants, etc) are seldom seen in ads.	Low sensory impact	1	1	1
Brand Equity/Image	How well is the product, service, or industry known among its potential customers? Is it trusted? Is it easily recognizable? The e-Business potential is higher for products with high brand equity because it will be easier to establish an online presence.	E-business implications: Sensory impact not a factor There is high brand name recognition among consumers, suggesting high potential for direct to consumer advertising and building on line therapeutic communities.	Pharmas invest heavily in brand name equity. Suppliers deal in commodities, therefore branding is not an issue	4	4	16
Emotive Connection	Is there an emotional aspect to acquiring this product/service? A high emotive content could result in a lower e-Business potential because of the impersonality of IT. However, there may be an opportunity to leverage a particular emotion to reach out to particular segments of the market.	E-business implications: High potential for direct to consumer advertising Pharmaceuticals can make the difference between sickness and health, even life or death. Emotive content is high, but expectations may not be realistic.	There is tremendous potential for liability. Pharmaceutical errors are recognized as a major public health problem. With few exceptions, no real emotive content associated with suppliers on part of consumers	4	5	20

E-business implications: education can improve quality and foster more realistic expectations

Total	57
Minimum Possible	5
Maximum Possible	125
Ratio	0.46

Transactional Factors			
Transaction Value and Frequency	What is the value of an individual transaction? How often does the transaction occur? High value and/or high frequency transactions in general are more attractive. However, it may be possible to use e-Business to create opportunities from low value and/or low frequency transactions.	These are high value transactions for the most part (high price for consumers, high profitability for the companies). If for a chronic condition, they are also high frequency. Pharmas dealing with hospital and managed care formularies sell in large quantities.	Transactions with suppliers can be high volume and infrequent, unless using just in time inventory management
Transaction Complexity	How many steps are required to complete a transaction? Are the steps difficult to complete? Are they hard to understand? Complex transactions bring E-Business potential since IT can be used to simplify and streamline business processes.	E-business implications: e-retailing may expedite repeat transactions Transaction requires first obtaining a prescription, then having it filled at a pharmacy. If the consumer is in an HMO, approval by a PBM may be an intermediate step. The lack of "one stop shopping makes these transactions relatively complex. Pharmas provide evidence from clinical trials to establish case for why a particular drug should be included in a formulary	Transactions are low complexity

E-business implications: on-line approval and purchase could reduce transaction complexity

Logistical Flexibility	How easy is it to access or move the product or service across different locations? How easy is to bring in raw materials and parts into the firm? High logistical flexibility can result in good e-Business potential because it implies a high level of location-independence.	It is generally easy for consumers to access prescription drugs unless they require climate control. Certain drugs may only be available from particular pharmacies. In addition, there is a limited shelf life for virtually all drugs.	The warehousing and shipping process is fairly flexible unless the instability of some chemical compounds requires special conditions.	Except for the few instances where the material is rare, restricted, or geographically inaccessible, there is relatively high logistical flexibility	3	3	9
E-business implications: ordering could be facilitated on-line, but close co-ordination with bricks and mortar warehousing							
Information Interoperability	Can information be easily exchanged among the stakeholders? Are there any standards for the exchange of this information? High information interoperability translates into high e-Business potential since IT is well suited for the exchange of structured information.	Direct to consumer advertising is a major marketing initiative, that can be facilitated by e-commerce.	Given the global nature of R&D and marketing, information exchange is constant in this information intensive industry.	Information exchange with suppliers focuses on price and product requirements	5	5	25
E-business implications: Information exchange all along the value chain can be greatly facilitated							
					Total	58	
					Minimum Possible	4	
					Maximum Possible	100	
					Ratio	0.58	
					Grand Total	194	
					Minimum Possible	15	
					Maximum Possible	375	
					Ratio	0.5	

11

SECURITY AND PRIVACY'S ROLE IN THE AGILE ENTERPRISE



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Marketplace conditions change faster than most enterprises can forecast or plan for. Enterprises must maintain an *agile posture* that supports them in quickly aligning with newly developed opportunities. An agile enterprise possesses the necessary infrastructure and processes to give them the flexibility to adapt to the constantly changing marketplace conditions, enabling them to take advantage of new and existing opportunities. Being agile does not, however, mean exposing an enterprise to additional risks that may ultimately outweigh the rewards that stem from taking advantage of the opportunities at hand, such as lower costs or improved efficiencies. To manage two specific potential risks to the enterprise, security and privacy, the establishment of a security and privacy infrastructure accompanied by the appropriate management, implementation, governance, and risk management will be a critical component to support the enterprise's drive towards agility.

NOT THE *ROADBLOCK* BUT A *PROCESS BREAKDOWN*

Often security and privacy have been seen as roadblocks impeding or even halting particular business initiatives within an enterprise. The roadblock label typically stems from an enterprise's sub-optimal execution of those particular initiatives. Specifically, security and privacy issues are often not addressed until after the

system has been designed or sometimes even after it has been implemented and is ready for deployment (e.g., not meeting national or multi-national requirements, such as the European Union Data Protection Directive). As a result, the response by those responsible for enterprise security and privacy is understandably reactionary at best, and often entails retrofitting the system or reengineering processes which results in additional, and unplanned, costs.

In addition, enterprises tend to view security and privacy from only a technology perspective (i.e., a firewall on the network or access control mechanism for an information system). Organizations often fail to recognize the core process components that contribute to their overall security and privacy functions, or overlook some of the regulatory and legislative requirements that are driven by other parts of the organization (e.g., financial reporting, such as Sarbanes-Oxley, or marketing, such as passing certain sales data from the European Union to the United States).

Enterprises that address security and privacy through a holistic approach, which includes aligning multidisciplinary resources across the organization (e.g. finance, operations, legal, and information technology), and establish support from appropriate governance and risk management groups, will most likely have the ability to address both current and future security and privacy issues, allowing them to gain additional information for evaluating new opportunities.

ROOT CAUSE: LACK OF COMMON RISK LANGUAGE

A primary root cause for security and privacy being seen as a roadblock can be traced to the communication barrier in most organizations regarding the view and definition of risk as illustrated in Figure 1.

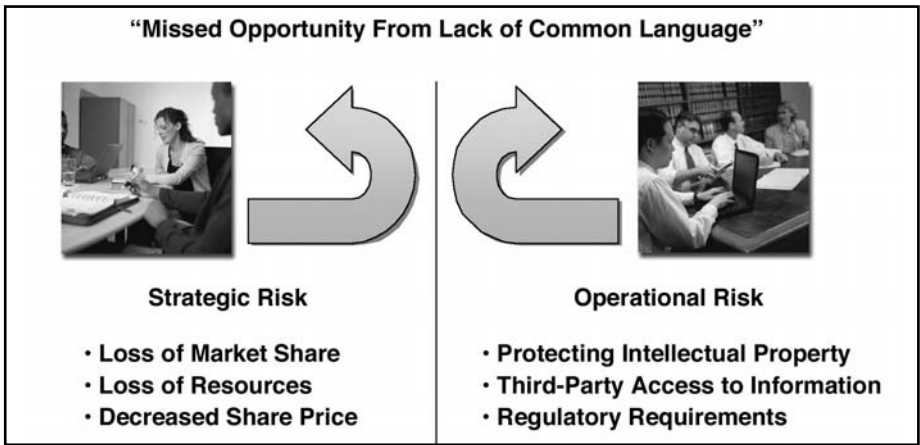


Figure 1. Lack of Common Risk Language in the Organization

Executive management tends to view and communicate risk in strategic terms:

- Losing market share
- Losing competitive advantage
- Reducing revenue
- Damaging the brand reputation
- Losing shareholder confidence

Security and privacy management and resources tend to view and communicate risk in operational terms:

- Not meeting regulatory requirements
- Allowing trading partners or customers to access internal information systems without appropriate access controls
- Providing company or customer data to third parties for processing that do not have adequate internal controls required to protect the data they have been provided

Breaking down this barrier between the different parts of the organization will require building a conduit that will get both groups speaking the same risk language. Establishing a common risk language will be a key to tying the operational risk terms to the enterprise's strategic risks, offering a broader view of the new opportunities facing an organization and helping to determine their impact as illustrated in Figure 2.

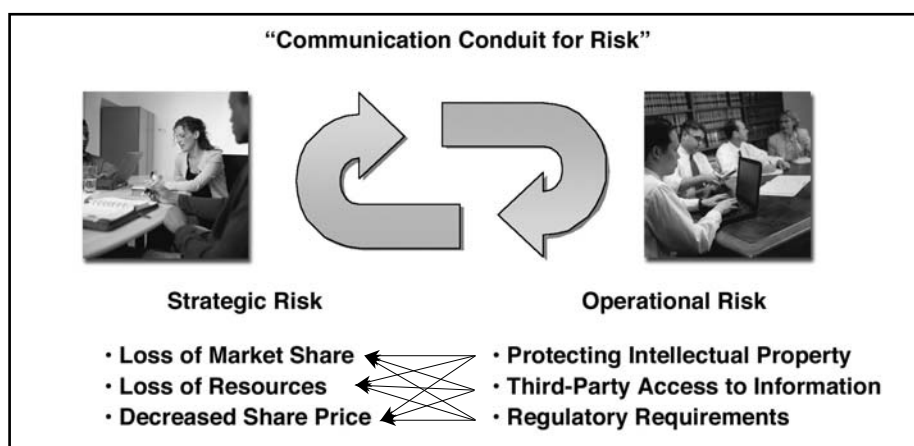


Figure 2. Communication Conduit

ADDITIONAL FACTORS AFFECTING SECURITY AND PRIVACY BREAKDOWN

Lost or stolen laptops used to top the list of scenarios that kept information security managers awake at night. Today, however, handheld devices that support 24/7 connectivity access and contain vital organizational data, typically lack security controls and are more easily lost by their owners. In addition, many organizations have been consolidating a myriad of systems into fewer, larger systems, and data has been aggregated into more centralized databases in an effort to reduce costs. However, in the process, the risk to these organizations has increased, at least in the event that the systems or databases are compromised, or if the information moves across national borders due to regulatory requirements.

Further, due to inadequate design and testing, viruses and worms have continued to plague organizations by causing unscheduled downtime and unplanned costs as they exploit vulnerabilities in applications and operating systems. All of this appears to be compounded by the number of local and national regulations impacting organizations as they move to take advantage of new markets. The labyrinth of privacy regulations at the state, national, and international level has challenged many organizations who are trying to effectively

Key Factors Leading to Security and Privacy Breakdown
COBIT Security Baseline: An Information Security Survival Kit.
IT Governance Institute, 2004.

- Lack of appreciation at the executive and management level for significant security and privacy risks and issues when setting business or information technology strategy
 - Lack of security and privacy strategies to set the direction for the organization
 - Security and privacy culture not communicated to all levels of the organization
 - Security and privacy framework that has been established or endorsed for the organization causing inconsistent implementation and management of security and privacy across the organization
 - Security and privacy responsibility, accountability, and authority not appropriately assigned for the organization
 - Inability to identify, manage, and (particularly) monitor security and privacy risk at all levels in the organizations
-

Table 1. Factors Leading to Security and Privacy Breakdown

comply with the requirements of these regulations, especially as they provide their organization's data to third-party processors and move business functions off-shore. The technology and regulatory landscapes will continue to change and evolve, but the basic concepts for integrating security and privacy into an organization will not change. Organizations typically expose themselves to these risks because security and privacy have been viewed as "one-time" events for an individual project, or companies simply do not have the elements in place to support security and privacy (Table 1).

SILO SECURITY AND PRIVACY: INEFFECTIVE AND INEFFICIENT USE OF RESOURCES

Typically, security and privacy is addressed on a project-by-project basis, which may or may not be aligned with the overall security or privacy posture for the organization, often generating the "Silo" security and privacy perception. In addition, security and privacy might even be addressed by resources with limited experience or training in security and privacy. Finally, the security and privacy implemented on the project-by-project basis usually degrades over time because many organizations do not have the skills sets or resources to maintain the multiple sets of controls that result from the numerous projects they have undertaken. Maintaining security and privacy requires a holistic, systemic approach supported by an overall strategy, with dedicated and trained resources that can be leveraged by multiple groups within the organization, and that have the authority to enforce the requirements outlined by the organization.

IMPACT OF THE SECURITY AND PRIVACY BREAKDOWN ON THE ORGANIZATION

Organizations have been trying to reduce costs through the consolidation of various information systems into fewer enterprise systems that leverage more enterprise-level controls. (Cohen, 2004) For example, enterprises have been implementing global supply chain management or customer relationship management systems, enabling employee access to real-time shipment data, pricing, or customer lists, creating a highly valued asset for many organizations for reducing cost and improving customer service. In addition, they have also been allowing business partners or customers to access these systems to track shipments, which may also

reduce costs and traditional customer support requirements. Finally, organizations have consolidated human resource systems to take advantage of shared services models to reduce costs for managing an organization’s workforce.

While an obvious positive outcome for these efforts might be the economies of scale that the organization could leverage to reduce cost, some outcomes that get overlooked come from the creation of a number of highly valued information assets that, if compromised, may have large, negative impacts such as loss of data or non-compliance with regulations (i.e., transfer of customer data from the European Union to the U.S. without permission from customers). These kinds of things may negatively impact the returns that the organization hoped to achieve through their original efforts.

In Table 2, we have outlined some of the current business initiatives that organizations have been undertaking in order to take advantage of opportunities in the marketplace and the risks that need to be considered, or managed, as organizations move forward to implement these initiatives.

Initiative	Issue(s)	Potential Operational Risks	Potential Strategic Risks
Regulatory (HIPAA, EU Data Protection, GLBA, Sarbanes-Oxley, Basel II)	• Compliance with a variety of local/ state and national regulations connected with security and privacy of information • Number of new regulations has been increasing to address consumer issues	• Fines or regulatory body actions, such as periodic audits for stated period of time • Damage to organization’s reputation	• Loss of Customer Trust • Legal Liability • Increased cost due to regulatory oversight and compliance • Loss of Brand Reputation
Globalization (Human Resources, Enterprise Resources Planning, Supply Chain Management)	• Consolidation of systems and data into one or several highly-valued systems • Use of enterprise-wide controls (i.e., user provisioning solution or web access solution to control access to several key systems) • Access control to ensure individuals or system have access to the appropriate data • Cross-border flows of information	• Compromise of single high-value system may have large impact to the organization • Comprise of single enterprise-wide controls system may impact more than one system • Regulatory bodies may stop the flow of data across borders, impacting the economies gained from using a single global system	• Increased cost due to regulatory oversight and compliance

Initiative	Issue(s)	Potential Operational Risks	Potential Strategic Risks
Offshore/ Outsourcing (In-country and out-of-country)	• Safeguards or controls in place to protect the access or store of your organization's data • Access control to ensure individuals or system have access to the appropriate data • Compliance with state or national regulations that an organization must apply to the data • Meeting contractual obligations	• An organization's data may be passed to other organizations or governments • Fines or regulatory body actions, such as periodic audits for stated period of time • Damage to organization's reputation • Breach of contractual obligations	• Loss of Customer Trust • Loss of Brand Reputation • Competitive Disadvantage
Collaboration	• Access control to ensure individuals or system have access to the appropriate data • Meeting contractual obligations, particularly when dealing with suppliers or customers who compete with each other	• Inappropriate access to data that compromises plans or trade secrets • Breach of contractual obligations	• Increased cost due to regulatory oversight and compliance • Loss of Market Share
Business Continuity	• Effective patch management system in place • Effective change management process in place • Business continuity plans in place • Effective data back-up process in place	• Vulnerabilities introduced into systems that may be exploited, particularly through viruses or for purposes of fraud • Business disruption from information not being available to employees, business partners or customers • Loss of key business data may impact revenue or profits	• Loss of Resources • Business Disruption • Competitive Disadvantage

Table 2. Current Business Initiatives Issues and Risks

AGILE ENTERPRISE APPROACH TO SECURITY AND PRIVACY

To address security and privacy for the enterprise, an organization can embark on one of three options outlined in Table 3. (Deloitte Research, 2004)

For organizations that select the *Wait and See* option, they will avoid short-term costs for security and privacy, but may have to deal with future penalties or damaged brand reputation. If selecting the *Bare-Minimum* option, they will address specific security and privacy requirements, but any investments made will most likely not be used to support other initiatives or future security and privacy requirements, since they will only address the current project. More importantly, the current investment in security and privacy requirements will be difficult to maintain without a program in place to support them over time. Finally, an organization that selects the *Strategic* option will not only make investments that can be traced to measurable benefits, but will most likely be integrated into the organization's core processes and be maintained on a go-forward basis.

CASE STUDY 1:

Federal Trade Commission Security and Privacy Actions

For additional information and cases, please go to <http://www.ftc.gov>

The Federal Trade Commission (FTC) has stepped up its monitoring of security and privacy. When lapses have occurred in organizations, the FTC has imposed requirements on those organizations to address their current security and privacy lapses and to reduce the likelihood of future lapses.

Example 1

Complaint cited misrepresentation of the security of personal information obtained from consumers through the company's website. It was found that a commonly known attack was used to gain access to customer sensitive information (such as credit card numbers) in clear readable text.

Continued

Option	Description	Benefits	Issues
“Wait and See”	Ignore security and privacy requirements based on the belief that the costs for compliance will exceed potential benefits or penalties for non-compliance	• Avoid short-term costs for security and privacy	• Damage to brand reputation • Penalties from Non-Compliance (See Case Study1: Federal Trade Commission Security and Privacy Actions)
“Bare-Minimum”	Treat security and privacy requirements as add-on costs that should be minimized	• Will address specific security and privacy requirements	• Any investment will be applicable towards the one project and initiative • Inability to leverage investment across various security requirements or projects – Silo Security an Privacy
“Strategic”	Treat security and privacy as a part of the business and operational processes	• Integrated into core operations • Investment can be traced to measurable benefits • Ability to demonstrate compliance with security and privacy requirements to third parties	• Requires an investment to build infrastructure and process supported by an overall strategy

Table 3. Enterprise Security and Privacy Options

Case Study 1 Continued

Example 2

Complaint cited misrepresentation of the security used to protect customer information. It was found that company's web site contained a security flaw allowing a user that entered a valid order number to view personally identifiable information and order history of the customer.

FTC Consent Agreements with organizations have included some of the following requirements:

- Requires the company to maintain a comprehensive information security program
- Requires the company to conduct an external audit on bi-annual basis for 10-20 years
- Requires the company to maintain and make available to the FTC certain documents and file compliance reports with the FTC

STRATEGIC APPROACH TO ENTERPRISE SECURITY AND PRIVACY

The Strategic Approach, as outlined in Table 4, allows agile organizations to identify the greatest risks to the business by getting everyone in the organization *on the same page* through the use of a common process to develop a common set of security and privacy requirements. This approach supports a more collaborative approach between different areas of the organization to make choices based on risk that still allow the organization to support the overall protection of its information assets.

IMPACT ON CURRENT INITIATIVES

Previously in Table 1, we outlined some of the risks for organizations that may be associated with selected business initiatives if organizations do not address security and privacy issues. In Table 5, we have identified how security and privacy may

Objectives	Results
• Identification of the greatest risks to business operations that are communicated and addressed through a standardized and efficient process using an internationally recognized framework (i.e. ISO 17799) • Development of a common understanding of the risks associated with the business operations to improve the communication between business units, application teams and security • Development of a process for reaching consensus concerning risks and the appropriate controls for managing those risks to increase the likelihood of implementing effective controls supported by the business operations • Develop a set of rationalized requirements to identify commonalities, resolving discrepancies and establishing a set of baseline requirements	• Established a service to collaborate with legal, finance, operations, and information technology for developing solutions to meet information protection requirements (i.e., “Transforming while Performing”) • Reduced time for the development and deployment of information protection requirements for applications through process standardization or optimization (i.e. support application development early in the lifecycle process) • Protected information, while supporting user access to the information (i.e., information is available to only the appropriate users when they need it) • Maintaining a consistent level of protection across the organization regardless of location

Table 4. Objective and Results for the Strategic Approach

act as the “enabler” to support the current initiatives and create opportunities to improve operations or address regulatory issues.

However, to realize the benefits and take advantage of the possible opportunities, organizations need to establish an enabling security and privacy foundation that can be leveraged across the organization.

SECURITY AND PRIVACY: THE ENABLING FOUNDATION

Security and privacy basically come down to choices based on risk.

Organizations that maintain the flexibility to quickly adapt to changes in their environment require tools, frameworks, and repeatable processes to allow them work through uncertainty and appropriately address the risks generated by the changes in their operations or business environment. For example, organizations

Initiative	Security/Privacy Enabler	Opportunities
Regulatory (HIPAA, EU Data Protection, GLBA, Sarbanes-Oxley, Basel II)	- Compliance with a variety of local, state, and national regulations connected with security and privacy of information - Number of new regulations have been increasing to address consumer issues	- Strategic Logging, Monitoring, and Reporting - Process Standardization/Optimization - Improved Data Integrity - Build Customer Trust - Leverage centralized, enterprise security and privacy resources
Globalization (Human Resources, Enterprise Resources Planning, Supply Chain Management)	- Consolidation of systems and data into one or several highly valued systems - Use of enterprise-wide controls (i.e., user provisioning solution or web access solution to control access to several key systems) - Access control to ensure individuals or system have access to the appropriate data	- Consolidated/Standardized IT - Process Standardization/Optimization - Leverage centralized, enterprise security and privacy resources
Offshore/ Outsourcing (Out-of-Country and In-Country)	- Safeguards or controls in place to protect the access or storage of your organization's data - Access control to ensure individuals or system have access to the appropriate data - Compliance with state or national regulations that your organization must apply to the data - Meeting contractual obligations	- Consolidated/Standardized IT - Process Standardization/Optimization - Build Customer Trust
Collaboration	- Access control to ensure individuals or system have access to the appropriate data - Meeting contractual obligations, particularly when dealing with suppliers or customers who compete with each other	- Competitive Advantage through leveraging non-core capabilities - Reduce development/ deployment time - Build Partner Trust
Business Continuity	- Effective patch management system in place - Effective change management process in place - Business continuity plans in place - Effective data back-up process in place	- Reduce downtime - Improve Data Integrity

Table 5. Current Business Initiatives Opportunities

that allow customers to access and manage their personal data through on-line systems reduce the amount of customer service calls but have opened up their IT environment to potential threats associated with using the Internet as a means of communication. The protection of data now requires that organizations have a dynamic view of the ways in which data is used and accessed (i.e., accessing information on-line or outsourcing data processing). Therefore, the Agile Enterprise needs to have a security and privacy foundation in place that efficiently and effectively supports the review of the risks related to its current environment and new business initiatives, and provides the appropriate risk management strategies that would allow it to take advantage of changes in the marketplace without adding additional risk to the overall organization. That security and privacy foundation is comprised of two main components, Infrastructure and Blueprints, as illustrated in Figure 3.

Foundation Part 1: Security and Privacy Infrastructure

The Security and Privacy Infrastructure provides an anchor for the foundation by providing the six key pieces needed to manage security and privacy through a holistic, programmatic approach. That approach establishes the requirements for determining its effectiveness for making adjustments based on periodic testing and monitoring metrics.

1. Governance

An ideal starting point for establishing a successful foundation in an organization is with a strong level of executive support and direction. Executive support comes in several forms, including:

- The appropriate communication to the organization
- Establishing a level of buy-in from the various individuals and entities that are involved or affected
- Providing the necessary business case behind the initiative
- Providing the requisite level of funding and resource commitments to make the foundation a competency that can be leveraged throughout the organization

2. Organization

Aligning the organization so that it has more security and privacy *agility* requires planning and analysis to understand the abilities of the resources and assigning the appropriate roles and responsibilities to them, as well as providing the necessary training to enable employees to fulfill new roles and responsibilities. For the agile

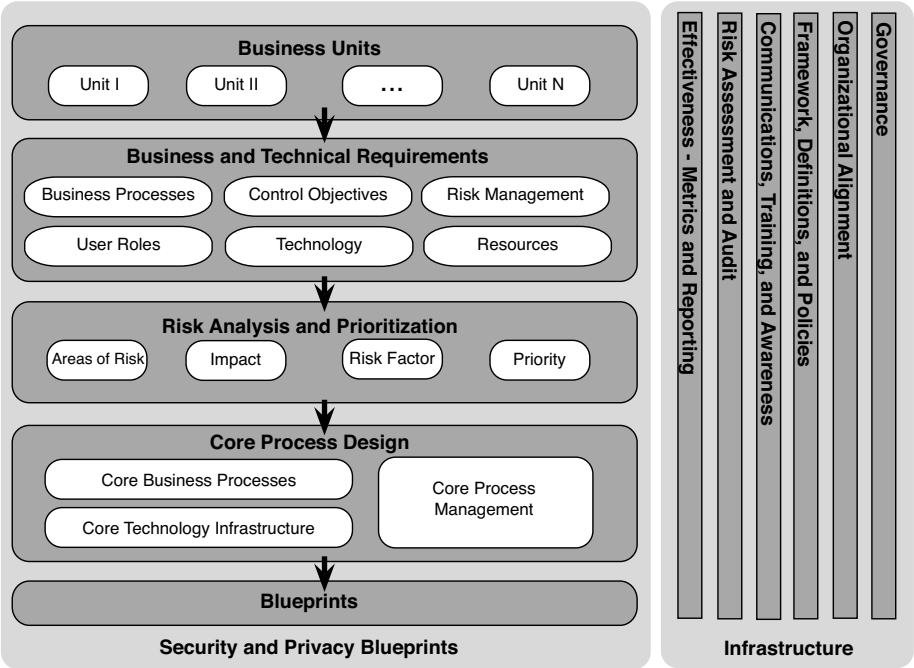


Figure 3. Security and Privacy Foundation

enterprise, individual resources may be *wearing multiple security and privacy hats* to help the organization maintain flexibility and become as adaptable as necessary to meet market demands. With responsibility, however, should come the necessary authority and oversight. It is important that the appropriate reporting structures, decision-making authority, and accountability are all established for each security and privacy role and function.

3. Framework, Definitions, and Policies

Effective communication within its various groups and business units is an important characteristic of the agile enterprise. If each group uses different terms, policies, procedures, and guidelines to address various elements of security and privacy (e.g. *silo security and privacy*), then it is going to be difficult to *interoperate* and even more difficult to make cross-functional changes and adjustments in response to market needs.

Therefore, several elements need to be put in place to make this happen. A glossary of terms and definitions can serve as a starting point to achieving consistency of the important security and privacy terms and concepts across the

enterprise.

Building upon the definitions is the creation of a standardized security and privacy framework incorporating the relevant security and privacy standards to be applied against the various organizational units or initiatives of the enterprise. Ultimately, the security and privacy framework drives the establishment of a common risk profile for the enterprise; this profile must be constantly maintained to reflect the level of risk the enterprise is taking against variable market conditions.

In addition to the internal standardization of security and privacy requirements, policies, procedures, and guidelines for the framework enable the organization to include any external regulatory requirements and compliance that relate to its products, services, and overall operations.

4. Communications, Training, and Awareness

"Lack of internal security awareness is still one of our biggest threats. Technology can reduce risks to a point but it is people who are the weakest link." – Deloitte 2004 Global Security Survey.

To help create awareness of the agile enterprise strategy among management and staff, it is important to go beyond typical tactics such as emails and voicemails. A formal training and awareness program allows the enterprise to manage the level of communication as well as the adoption of the strategy.

Context-based training is a valuable way to efficiently execute a training and awareness program. This type of training is preferable because security and privacy training information is organized on a user-role basis. As such, individuals are provided with information that is specifically relevant to their role(s) within the enterprise, rather than being presented with a broad-based document or training guide that is intended to cover a varying audience. Implementing some form of recurring training to refresh and update individuals on a periodic basis, as well as asking questions to assess adoption and effectiveness, are also good ways to optimize the training and awareness program and measure its effectiveness.

5. Risk Assessment and Audit

Periodic risk assessments are necessary to help the enterprise manage risk and understand if its risk profile is in line with reality. This is part of the overall governance function, but it can be carried out by a variety of units within the organization. Internal audit, for example, might include certain security and

privacy control objectives as part of their periodic internal review process and system audits. Similarly, IT may include certain security and privacy requirements as part of their infrastructure management procedures. Ultimately, it is important to respond to changes in the marketplace and to make sure that the enterprise is able to effectively account for them in its risk profile. To do this, the enterprise should build checks and measures into its business processes, such as an application or product development lifecycle, and reevaluate the requirements on a periodic basis.

6. Effectiveness—Metrics and Reporting

A key theme in making the enterprise more agile is consistency. Establishing an agreed upon set of measurements by which to carry out functions such as governance, risk assessment, and training and awareness allows for a consistent and balanced comparison of how various processes are being implemented and managed.

Foundation Part 2: Security and Privacy Blueprints

“In Today’s uncertain environment, companies must first of all understand their greatest risks, threats, and vulnerabilities. While this sounds relatively obvious, many companies don’t have a clear grasp on their risk “profile”. In fact, 36 percent of the corporate directors surveyed admit they don’t fully understand the risks their companies face. — Prospering in the Secure Economy, Deloitte Research

To effectively implement security and privacy, development should be done in the context of business processes. This means going from the initial buy-in at the business unit level through the following:

- The gathering of requirements
- The analysis of risks to the enterprise with respect to the problem being solved
- The design or structure of components of a solution and leveraging of its core processes

All of this should result in the implementation of a final design of an agile blueprint. These processes are built on top of a security and privacy infrastructure that can be implemented at several levels including policies, guidelines, procedures,

and automated controls. What security and privacy measures are used to address specific requirements, what their priorities are, and at what level of detail they are implemented can be evaluated via a risk-based approach. The impetus to drive the entire process of building the blueprints must really start with the business units.

Business Units

Business units must obtain the requisite buy-in for an initiative to commence, and then help drive the process from conception to deployment. They are usually responsible for paying for a project and will often be the end users. Thus it is essential that they take the appropriate ownership and make certain that the various security and privacy processes, as well as the supporting infrastructure, meet their needs.

Business and Technical Requirements

As discussed, it is important to consider security and privacy in the context of the organization's overall business and functional requirements. To do so, they need to be integrated as fundamental elements of each area that is included in the scope of the infrastructure design effort. For example, if the infrastructure is supporting the entire enterprise, security and privacy requirements should be considered in the context of HR, finance, IT, audit, legal, and the various sales and business units that comprise an organization.

There are many flavors to the controls themselves. They can be grouped into organizational controls, technical controls, operational controls, and physical security controls. This approach to addressing security and privacy controls is the basis for many widely accepted frameworks and recommended approaches, such as the International Standards Organization's ISO 17799 (based on the British Standard 7799) and various guidelines from the U.S. National Institute of Standards and Technology (NIST).

Once a common framework is adopted, the enterprise will have a common language by which to gauge risk, whether related to employees, operations, systems, software vulnerabilities, or some other area. The combination of all of these risks will aid in defining the enterprise's overall risk profile.

Risk Analysis and Prioritization

In particular, what needs to be understood for each security and privacy measure is the business risk associated with not having that measure in place, the impact to the enterprise in the event that the particular requirement is not met, and the

likelihood that the proposed measure could be defeated. Those three components combined yield an overall risk factor for each requirement. For example, to protect personal information there are several measures that could be considered. They might be a simple policy asking users to access only those things which they should have access to; some guidelines and procedures on how to go about accessing only relevant information; or some form of technical control such as a short numeric pin, a strong password, a hardware token, or a biometric authentication device.

Now that we understand the potential measures that could be taken, understanding the value of the information being protected (i.e. the risk should that information be compromised in some way) and the cost of implementing and maintaining the control, will dictate which one is selected. As an example, one would probably not protect a marketing mailing list with biometric authentication tokens, just as one is not likely to protect a set of active customer credit card numbers and expiration dates with a four-digit numeric pin.

Understanding and addressing the risks that an organization is exposed to from a security and privacy perspective is only the first step in the process. However, it is essential that an ongoing management process is put in place to monitor, report on, and regularly evaluate the performance effectiveness of the measures that have been implemented to counter various security and privacy risks across the enterprise's *Core Business Processes*, *Core Technology Infrastructure*, and *Core Management Processes*.

Core Process Design

Core Business Processes and Core Technology Infrastructure need to be defined, developed, and deployed in concert with the enterprise's Core Security Operating Model and risk-drive, standards-based, risk requirements. As with all other elements of the agile enterprise, this approach provides fundamental security and privacy building blocks to address core processes and their supporting technologies, which can subsequently be leveraged in a flexible yet reliable manner depending upon the business risks associated with a particular function. One example of such a Core Business Process is Electronic Data Interchange (EDI). From a security and privacy standpoint, clearly some requirements need to be put in place; however, they depend strongly on the context in which the EDI is taking place, e.g. the exchange of sensitive or confidential, personally identifiable information requires a more stringent approach than, say, exchanging a list of part numbers. Ideally, one or more Core Technology Infrastructure components would be in place to handle the security needs, again, depending on the specific context.

Given that this foundation provides us with a suitable vehicle to propagate security and privacy across the enterprise, there is still a level of abstraction that

needs to be implemented in order to make these core processes and technology infrastructure usable. As with many foundational components, such core building blocks can often be leveraged in several ways. Establishing a series of strategic blueprints will provide the enterprise with a streamlined method by which to consistently implement security and privacy.

The previous example of EDI, which featured a Core Business Process and supporting Core Technology Infrastructure around EDI, lacked a specific context. A blueprint would provide that context. An example might be a blueprint to address the electronic transfer of confidential or sensitive personally identifiable information. There are many operations across an enterprise, such as customer support, sales, marketing, and others that might have cause to address such a requirement. Using a blueprint provides a consistent way for everyone to handle the situation in terms of what Core Business Processes need to be leveraged, and what supporting Core Technology Infrastructure components need to be included.

Extending the EDI example, now that we have a blueprint that addresses the electronic transfer of confidential or sensitive, personally identifiable information, let us say that the specific scenario we are concerned with is an outsourced payroll function. Clearly we would be concerned with various procedures and technology controls to safeguard sensitive information as it is being transferred to and from a third party.

Blueprints

Once key strategic blueprints are in place, it is essential that they be leveraged where possible, otherwise the entire effort involved in the build-up to this point will be for naught. As various functional processes are re-calibrated to reflect the relevant blueprints, the appropriate security and privacy components integrated into each blueprint will also be reflected as part of the overall changes that are made. Case Study 2 illustrates the use of the agile security and privacy blueprint through a hypothetical ERP system implementation scenario.

CASE STUDY 2: ERP Security and Privacy Considerations

Deploying a ERP system requires significant forward planning to understand the design elements of the system, the specifics around system implementation and testing, and the roll-out strategy. Our hypothetical ERP system implementation outlines the process for developing a security and privacy blueprint.

Stage	Task	ERP Example
Requirements	Gathering Business and Technical requirements	Define the business and technical requirements of the ERP system, for example, an HR module
	Definition of control objectives	Define the control objectives to handle the security and privacy of the HR data, as well as the inflows, outflows, and supporting infrastructure
	Identification of potential risk areas	Identify risk areas such as the collection, storage, and management of personally identifiable information and the need to meet HIPAA requirements
	Definition of process roles and responsibilities	Define process roles and responsibilities (human and system) such as administrators, automated tasks to synchronize the HR system with source repositories, and various user-types who will enter information in to the system and run reports
	Technical requirements and constraints	Capture technical requirements and constraints such as the physical system configuration, requirements on patching, integration with Enterprise Security Management tools, and limitations to connecting with data repositories
	Identification of resource and budget requirements	Identification of resources such as developers, testers, and the associated budgetary requirements for the resources and tools necessary to complete the implementation
Risk Analysis	Identification of potential risk areas	Identify overall risk areas, leveraging those captured in the requirements stage. These may include things like a lack of resources, system compatibility issues, and potential changes in the regulatory environment.
	Likelihood and potential impact of each risk area	Defining the likelihood that each of the items identified as a risk might actually take place, and the impact in the event that they do take place
	Definition of an overall risk factor	Use the previously defined parameters to capture overall risk factors for each risk area

Stage	Task	ERP Example
Process Design	Definition of core business processes, technology processes, and management functions	Using the previously defined requirements and identified risk areas, define cohesive processes, e.g. the hiring of a new employee. Leveraging the various requirements captured at a business and technical level, integrate constituent tasks such as entering a user into the HR system, initiating workflows to a variety of downstream systems such as payroll, IT, business cards, finance, and the employee’s functional area, to begin the on-boarding process. Each of these processes will have corresponding technology processes, for example, how a business card request workflow might be completed technically (such as using an email trigger, or automatically generating and sending a work order to a third party printing firm). The combined process solution, i.e. business and technology, will have an overarching management process to ensure timeliness, quality, and response. For example, these functions might include defining a response time of one business day from time of receipt to follow up on a request.
Blueprints	Defining Blueprints	While various core processes (business and technical processes with an overarching management process) have now been defined to provide more detail to what was originally an abstract series of business and technical requirements, how the core processes are implemented are ultimately a higher-level decision. For example, there might be several business and technical processes to implement a business card request workflow as mentioned above. However, while there are several combinations available, one specific combination must ultimately be selected. The ultimate selection of a series of process options at each level, business, technical, and management results in a single blueprint—in this example the business card selection blueprint. As business processes change, additional core process elements can be defined in a detailed enough manner as to be available to the entire enterprise. They can chose to evaluate whether those new process elements might be valuable to adopt as part of an existing or new blueprint.

Agile Security and Privacy: Strategic Approach and Foundation

Even with all of the advantages put forth by outsourcing or collaboration, not addressing the security and privacy issues related to these efforts up front and early may cause these initiatives to fail due to the increased risk to the organization, based on the complexity of handing company data to third parties, or allowing third parties to access an organization's environment. Security and Privacy need not be the *roadblock* for agile organizations. The reality is it can be the *enabler*. Agile organizations can typically breakdown the communication barriers and address the key factors leading to an overall failure in security and privacy through adopting a Strategic Approach. In particular, establishing a conduit for communication and putting into place a security and privacy infrastructure and blueprints should provide Agile organizations with the ability to take advantage of opportunities that enhance revenue, reduce cost, maximize shareholder value, or preserve market share while protecting brand reputation and improving risk management.

The use of a holistic, cross-functional approach, as detailed in this chapter, is essential in helping an enterprise effectively address the many security and privacy issues and needs that it has. More importantly, such an approach provides a strong framework to strategically help the organization be agile: that is, to understand its security and privacy posture; address the issues in an organized and easy to leverage manner; and then manage and evolve the execution of the strategy to account for the changing marketplace. The key to solving security and privacy issues efficiently is to look at each issue as a series of steps rather than breaking it out separately for each function or department. This is the idea behind core business and technical processes. That allows for consistency across the organization in terms of how a problem is looked at (i.e. its constituent components) and efficiency in terms of solving the various elements of the issue one time for the entire organization. Leveraging these building blocks, and using the notion of blueprints to take a set of core processes and turn them into a specific solution for a particular area of the business, allows for flexibility in terms of being able to use those core processes that best fit a particular part of the enterprise. The built-in considerations for the supporting infrastructure, including oversight (in the form of both monitoring and general oversight), allow for the identification and handling of quick adjustments and longer term strategic changes to take place in an organized and consistent manner.

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SMALL MANUFACTURERS AND THE AGILE ENTERPRISE



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INTRODUCTION

The Agile Enterprise is a business structure and behavior pattern that responds to the constant changes imposed on today's businesses by the market forces, technology trends, and globalization imperatives. Becoming an agile enterprise with the ability to respond quickly and effectively to changes in the global business environment is a business necessity. That means adding the tools, techniques, and technologies to your small business' operations. Which tools, which techniques, and which technologies depends on your customers and markets. It's an organization with a flexible business model and the capabilities to respond quickly, effectively, and profitably to changes in customers, markets, and competitors.

The keys to achieving such an organization lie in each particular company's structure and behavior—its products, processes, systems, cultures, and leadership. The what's and how-to's differ from company to company, industry to industry, and supply chain to supply chain. What you do and how you do it depends on how large or small your company is, what resources you have available to invest in change and adaptation, where you are in the supply chain (as well as what power you hold in it), and your willingness to take risks. A recent study (Lehtihet, Wilson, and Susman, 2004) for the National Institute of Standards and

Technology's (NIST) Manufacturing Extension Partnership (MEP) looked at the future of manufacturing businesses in the U.S. and identified a number of factors that will affect manufacturing businesses. Figure 1 shows the linkages between global trends, strategic responses, and SME choices. Some of these things are in your control and some are not.

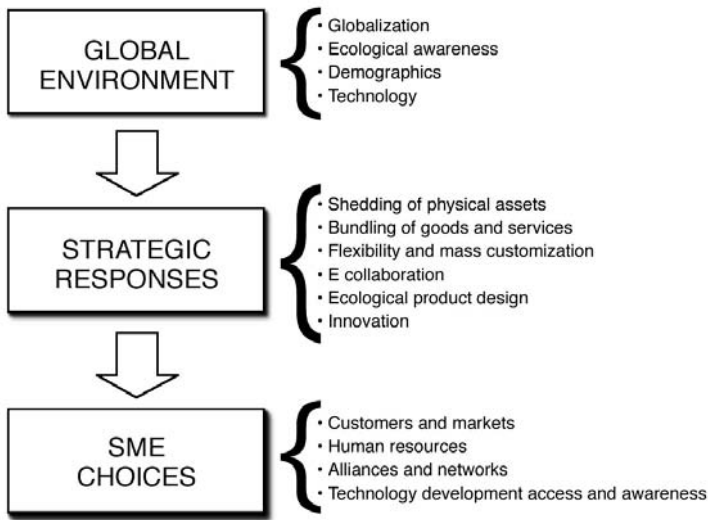


Figure 1. Framework for thinking about the future of manufacturing businesses
(after Lehtihet, Wilson, and Susman)

Among the factors are globalization, ecological awareness, demographics, and technological advances. Each of these factors includes several subcategories that will impact not just manufacturers, but all business. For example, under technological advances, one might include large technology categories like biotechnology and nanotechnology, many aspects of which are still in the early stages and whose impacts are not yet known, and advances in a specific technology such as microelectrical mechanical systems (MEMS) and radio frequency identification (RFID) systems. In response to these factors, firms can choose from a number of strategic choices as a response. These choices might include things like shedding of physical assets, bundling of goods and services, customization (mass), and innovation. Implementation of those choices, in turn, requires organizational change and adaptation. The leadership of an agile enterprise knows that things will continue to change, and puts in place an adaptable structure and set of behaviors that can best take advantage of change. This is what will make a company an agile enterprise.

In this chapter, we will focus principally on smaller manufacturers, as they are the principal focus of NIST's Manufacturing Extension Partnership program.

The National Academy of Public Administrators (NAPA) has described the challenges and barriers they face in improving performance in a recent report. (The Manufacturing Extension Partnership Program, 2003, 2004) Those reports build on an earlier study of small manufacturers by the National Research Council (NRC). (Learning to Change, 1993) Both reports concluded that small manufacturers face the following barriers:

- Disproportionate impact of regulation
- Lack of awareness
- Isolation
- Where to seek advice
- Scarcity of capital

In addition, the NAPA report concluded that additional challenges have emerged since 1994 including:

- Rapidly increasing competition from companies located in low cost countries
- Explosion in availability of information and information technology
- Insufficient access to knowledge workers
- High cost of providing health insurance for employees

NAPA also pointed out that some of the barriers identified in the NRC report are less important than they once were.

Let's look at each of these barriers in turn and what they mean for smaller manufacturers. The regulatory environment creates a disproportionate burden for smaller firms. National, state, and local initiatives and decisions concerning trade, the environment, employment, work place safety, health care, and liability have a direct impact on the competitiveness of manufacturing companies. The amount of time and effort required to comply with complex regulations is a disproportionate burden for smaller organizations. One result is that the economic impact of regulatory compliance is much greater as a percentage of capital investment than it is for larger businesses.

Smaller manufacturers are often unfamiliar with changing technology, production techniques, and business management practices. The staff and senior managers of smaller manufacturing companies must devote most of their time and energies to managing the day-to-day operations of the firm. As a consequence, those companies are less likely to be aware of the best manufacturing practices, innovative application of new technologies, and fresh approaches to improved production efficiency. With less relevant experience and expertise, their

expectations for successfully selecting and effectively assimilating new technology are not high, and so they are less likely to risk investment in new ways of doing things or in major changes to the management structure and relationships within the business.

Smaller manufacturers are generally isolated and have too few opportunities for interaction with other companies in similar situations. Interaction with other firms is essential to continuous improvement. These associations seem to be most productive when they occur among companies of similar size and with larger organizations that might be role models for smaller firms. The chance for suppliers to interact with major customers, to benefit from membership in a supplier improvement program, or keiretsu-like confederation of companies (a Japanese interlocking company structure), can significantly improve the chances for smaller firms to improve their performance.

It is difficult for owners and managers of smaller companies to find high quality, unbiased information, advice, and assistance. When companies need help with technical problems, when they want to replace production or design equipment, or when they want to upgrade the skills and talents of their workforce, they are often at a loss for sources of assistance. Searching for help in the public sector often reveals a confusing, uncoordinated array of services—universities, economic development groups, technical schools, government agencies—competing for clients. Inappropriate choices can waste precious resources and time, a waste that a smaller firm cannot afford.

Operating capital and investment funds for modernization are difficult for small and medium-sized manufacturing firms to obtain. The financial community does not readily understand manufacturing and often perceives loans for new equipment as unattractively high risks. Smaller firms are unlikely to have the capabilities needed to put together proposals for funds in the format familiar to lending officers. The consolidation of banks, with some exceptions, has removed much of the decision making from the communities where many loan officers have traditionally relied on the “known character” of management and owners in lieu of collateral. The first phase NAPA report asserts that this is not as large a barrier as it was in the early 1990s, although it is still true in some selected parts of the country.

The rapidly increasing competition from companies located in low cost countries has real and potentially serious consequences for any company that is engaged in a commodity business. Companies in these low-cost countries (Brazil, China, India, Malaysia, and South Korea, for example) have both lower cost labor and equivalent technology to U.S. companies with which to make products. Coupled with the declines in telecommunications and transportation costs seen over the past decade, companies in these countries can deliver comparable quality products at lower prices than can U.S. companies.

The explosion in availability of information and information technology has led to increased efficiencies and decreased transaction costs, when used intelligently. It has made global markets a reality and products can be sold or sourced from anywhere (within the bounds of law and regulation). Used poorly, though, information technology can be a drain on company assets, and an overabundance of information can be just as bad for decision-making as too little information.

Insufficient access to knowledge workers means not having the workers with skills you need when and where you need them at a price you can afford. The shortage or lack of access runs across all areas including management, information technology, marketing, sales, product development, engineering, as well as production. It is not clear whether there is an absolute shortage of skilled workers or whether it is a question of affordability of these workers on a full-time basis. In either instance, though, the result is that the company does not have the people it needs and so is constrained in a variety of ways.

The final barrier, the high cost of providing health insurance for employees, does not typically affect productivity directly, but does have implications for the company's bottom line and ultimately its competitive position. The more of a company's money that is dedicated to health care costs, the less is available for other investments in people and/or technology.

If we look more closely at the barriers identified above, we note that some of them can be at least partially overcome through the use of technologies and practices represented by a truly agile enterprise. For example, the issues surrounding isolation and a lack of awareness of new technologies have been ameliorated in part by ready access to the Internet. Compared to 1993-94, when the NRC report was researched and written, it is relatively easy to search for technical and non-technical information that can help a small business owner become informed about new processes, new technologies, and new market opportunities.

We will examine today's business environment, the business and manufacturing processes needed, and supporting infrastructure, along with strategies you can adopt to start to move toward being an agile enterprise and staying competitive in a global economy.

TODAY'S ENVIRONMENT

Today's business environment places many demands on companies of all types and sizes. For small manufacturing firms, though, the confluence of factors outside of their control, especially globalization and technology developments, has the potential to wreak havoc. There are cost, delivery, and quality pressures like never

before, driven in some respects by large multi-national firms and by foreign governments in others.

There has been a lot of attention devoted lately to how large, multi-national firms are moving operations and jobs to lower cost countries, China and India principally. This is part of an offshoring trend (the sending of production of goods and services to other countries) that's been going on for years. In previous times, it was Mexico, Malaysia, Singapore, and Taiwan. Until recently, what is known as offshoring was mostly outsourcing, and went to domestic, in many cases, local plants and firms. The basic idea was that the large firm could buy items of higher quality and lower price than they could make themselves. As companies outsourced more parts, components, and systems, they continued to look for lower cost sources of supply. With the advent of the North American Free Trade Act (NAFTA), Mexican and Canadian companies became easier places with which to do business. Telecommunications and transportation costs have decreased substantially, making the rest of the world more accessible—both as a market to sell to and as places from which to source.

These outsourcing and offshoring phenomena are true not just of products, but services as well. Call centers and computer programming are just two examples. Today, you can find reasonably priced service companies to provide you with first-rate programming talent or knowledgeable, English-speaking staff who are available 24/7. Some countries ship work to the U.S., legal and financial services, for example, and those services are provided here more frequently than elsewhere. It's a brave new world. Whether you're ready or not, you're a participant in the global marketplace. As a consumer, it's easy. Generally, you look for the best quality at the lowest price—value. Look at the labels. Where does it come from? Frequently, it's not American made.

That's part of today's global reality. Labor costs in Taiwan are about 1/3 of U.S. costs, India 1/4, and Mainland China is about 1/5. They're also working in facilities that are state-of-the-art, or close to it. And, it's not just low-cost labor. There are lots of well-educated people around the world, and countries like China and India continue to improve their already very good post-secondary education institutions. In addition, many foreign scientists, engineers, and business people were trained in America's best universities and have moved back to their native countries. They see opportunities overseas to build businesses they couldn't build here. The American Way has been exported too, and that means competition can come from anywhere, not just down the street. With cost advantages of at least 20%, you can lose customers overnight to global competitors.

Having said that, outsourcing can be good, if it's to you, while offshoring probably isn't unless you're prepared to have a global presence. In this kind of environment, how do you then compete? If your business strategy is based on

being the lowest cost producer, you're in a race to the bottom and you might want to rethink your strategy. Basically, there are a handful of strategies you can choose, but successful companies are adapting themselves and their strategies to offer higher value to customers. They're moving from being commodity producers of high volume, simple products to specialty producers of more complex products and they're getting choosier about their customers.

The rest of this chapter is devoted to what you, as a small manufacturer, need to do to survive and thrive in this environment. Figure 2 shows how your manufacturing business links to other businesses through your business processes and networks.

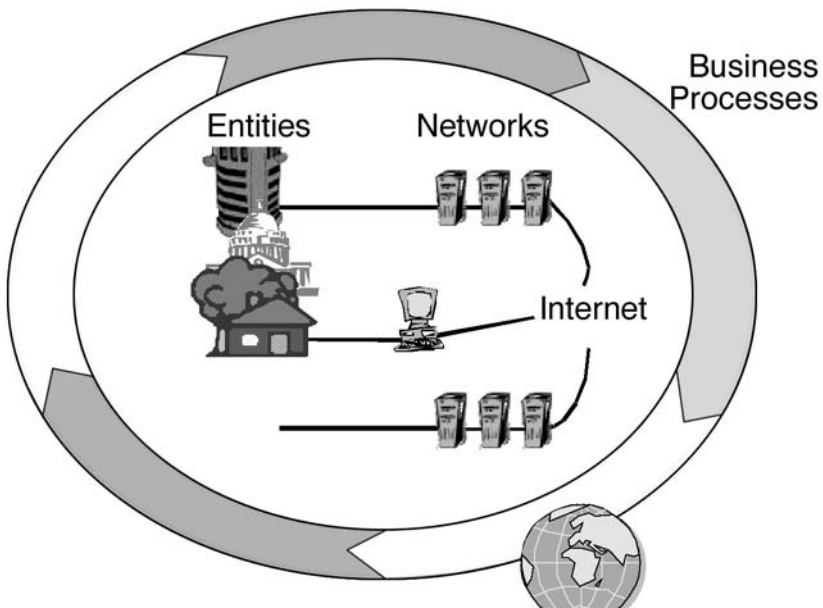


Figure 2. This graphic shows the linkage between your manufacturing business, customers, and suppliers through business processes and the network.

In part, it's about agility. At least as long ago as 1995, agility in manufacturing firms has been a topic of study and discussion. (Next Generation Manufacturing Report, 1995). Many of the studies have included sections on the extended enterprise and enterprise integration: eBusiness, eCommerce, eSecurity, etc. While these studies provide the what, they do not provide the how, that is, how to accomplish the what while maintaining profitability of the firm. This is especially true for smaller manufacturing firms. Today's economic environment challenges these firms more than ever before.

You need to learn to cope and use the trends yourself. To take full advantage of this environment, you need to have the fundamentals in place, and you need

to distinguish yourself with a service and/or business model. The fundamentals include:

- Infrastructure: stable electricity, internet connectivity, telecommunications, and transportation
- Processes: stable business and manufacturing processes that link internal and external environments
- Relationships: customers, suppliers, and collaborators

Let's look at each of these in turn.

INFRASTRUCTURE

When we talk about infrastructure, we include the basics: electricity, telecommunications, and transportation. All of these things, with appropriate back-ups and plans for using them, are required of agile enterprises. For example, one of the drivers imposed by lean manufacturing principles is just-in-time delivery. That usually means smaller, more frequent deliveries to the customer. In turn, that means your communications with your customers and suppliers, as well as transportation links need to be in sync with the delivery needs. If you're located in a place where the transportation infrastructure—roads, airports, and ports—is substandard, you'll have a hard time convincing the customer you can make the deliveries. Similar things are true if the electric grid or communications infrastructure is substandard as well.

Business Processes

Stable, repeatable processes are required. You must integrate internal and external business processes that take advantage of information to compete in the digital/networked marketplace. For better or worse, and for smaller companies it's frequently worse, many software packages, whether they're in-house applications or outsourced to vendors, require stable, repeatable processes. That includes data fields and structures, and means doing the same thing the same way every time. Earlier packages especially required that your company adapt to the software's process, not that it would adapt to you. This is still true today, as bigger customers dictate not only results they want, but also information flows they want that will integrate with their applications. As you might guess, different customers,

especially big OEMs will insist on their own information flows and structures, and you can be pretty sure that they'll be different, even in the same industry.

At some level, this is just an extension of the intent of various quality systems like ISO 9000 and its successors/relatives (ISO 9000-2000 and ISO 14000). Unfortunately, these standards have balkanized to some extent as each industry has decided that it has to have its own version. Thus, we have not just ISO 9000, but AS 9000 for the aerospace industry, QS 9000 for the automotive industry, and TL 9000 for the telecommunications industry among others. Each includes the basic elements of ISO 9000, but then adds other elements specific to the industry. That's fine if you're only in one industry, but small suppliers are frequently supplying more than one. Take the example of electrical connectors. As a supplier, your product may go into any of the three industries listed above. That means you end up adding all the extra steps required that are special for each industry. Now, imagine yourself as a supplier in the supply chains for two major automotive manufacturers, plus a truck manufacturer and a forklift manufacturer. How many different processes and systems would you be expected to support? It depends on your customer base and their needs.

With on-demand that's changing. There is more flexibility in data structures, formats, and labels to make sharing of data simpler and easier.

Manufacturing Processes

Like your business processes, your manufacturing processes must be stable and repeatable, while allowing you to meet cost, quality, and delivery requirements. Lean manufacturing principles allow you to simplify the processes and systems, making them as flexible as possible. Six sigma principles allow you to continuously monitor and improve the quality of all processes. Here especially, the incorporation of a variety of sensors and monitors into the process and process controls allows you to control the manufacturing process and consequent quality and repeatability to an unprecedented degree. It also requires an internal computer network/system to coordinate the outputs of the various sensors and monitors, and store and analyze the data.

System Requirements

The amount of data that comes from the variety of business and manufacturing processes has been increasing, and the computer system, whether internal or external, must be able to process, store, and analyze it. There is also data that

must be exchanged with your supply chain partners. That data can include financial information, design data, and logistics information, all of which needs to be available to different members of the chain, but not to everybody in every company in the chain.

Participation in supply chains requires that small companies pay attention not only to the data, but also to its security. The data requirement includes not just the data itself but the computer systems and data structures needed to manipulate it. Some of these requirements will be imposed by your biggest customers. The security requirement means not only the data/information they send and receive but also the physical security that protects the infrastructure and systems. That means that things like rooms where servers are located have limited access, limited to only those who need to be there, as well as more mundane things like making sure your computers are not located under water pipes. Many of these physical and information security items are addressed in NIST's eBusiness Security tool, available at <http://escan.nist.gov/sat/index.nist>. Specific topics addressed include:

- Computer virus protection
- File permissions
- Computer system physical environment
- Back-up policies and procedures
- Potential computer system mechanical failures
- IT contingency planning
- Information technology and security policies
- International eCommerce concerns
- Internet and eCommerce
- Operating systems and security concerns

This diagnostic tool is designed to assess the electronic security infrastructure of a small business and provide an action plan for improving it. It will provide the user with a set of recommendations to correct security problems, and help develop a more secure model for future interactivity.

The requirement for integration with customers and suppliers can be accomplished either via your own internal systems or through outsourcing contracts with any of a number of suppliers.

RELATIONSHIPS

Without customers, there is no business. Today's environment requires being connected to customers more than ever. Understanding and responding to their

needs and wants becomes paramount. Whole books (Wiersema, 1996) (Collins, 1995) have been written on how to accomplish this understanding and response. In the end, it's not about what you have to sell. It's about how your customers want to do business with you. Many of them have preferred ways of doing business, whether it is via the Web, with preferred ways of delivery, billing, etc. Application of the process shown in Figure 3 can help you to better understand your customers, markets, and competitors and the use of that knowledge to drive your sales and marketing tactics and plans. It will also tell you what you need to achieve inside the plant in your manufacturing processes.

The process has seven steps, starting with learning about and choosing the customers with whom you want to do business, and ending with the after-sale service. Along the way, you match their needs with your products and services, sold and delivered the way they want them. Using this process imposes a discipline on your operations and linkages to the outside world. Within this process, there are numerous opportunities to apply the concepts of an agile enterprise from a customer relationship management system that lets you keep track of each customer and order, to providing self-service (such as repair manuals or usage instructions) via your Website.

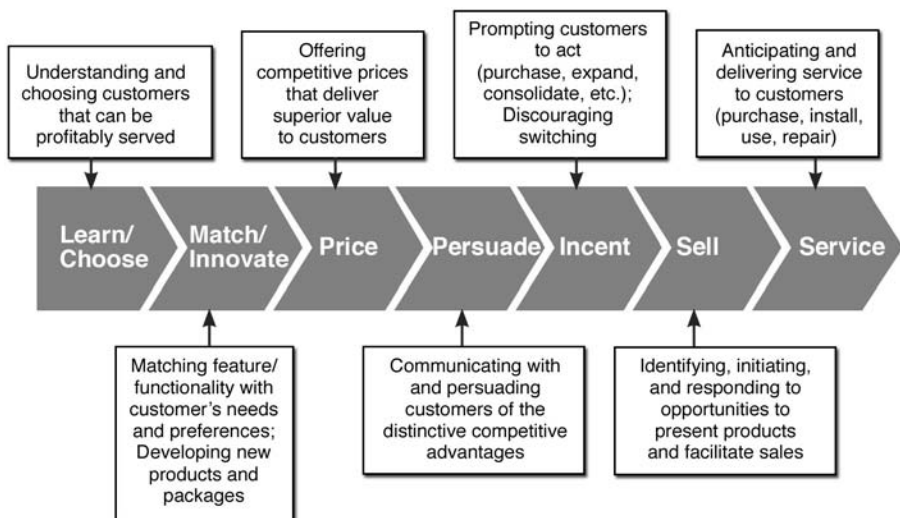


Figure 3. Marketing Process

It's also very easy to lose customers now. Let me give you one example. An Ohio-based company I know, an electronic board manufacturer, was a supplier to a number of large companies. Their business included both design and fabrication. They'd done business with each other for years. The large companies went to China about a year and a half ago, based on cost, but didn't take all the business.

They asked the Ohio company to troubleshoot and rework imported boards that weren't up to snuff. As you might expect this is a very different business that requires far fewer people, equipment, and facilities. Even though they'd done business together for a long time, though, the fact that the large companies surprised him by taking the business overseas shows that his relationships with the customers weren't as good as he thought. A second example of this situation involves a specialty machining company in upstate New York. They'd been a supplier to a Tier 1 automotive parts supplier for a number of years. Recently, the Tier 1 company came to them and told them a joint venture had been formed between the Tier 1 and a Chinese company. All the business was being moved to China, and there was no recourse. Because the Tier 1 company represented such a large percentage of the business, this company is now in serious trouble and will have to scramble to stay in business. Again, the company owners believed they had good relationships with the Tier 1 and a capability that couldn't easily be replicated, they quickly found out that wasn't the case. What could they have done differently?

Let's look at what companies are doing specifically with information technology and how you might do things better or differently to move toward being that agile enterprise. In 2000 and 2001, MEP conducted two studies (NIST MEP Study, Phase 1, 2000, and Phase 2, 2001) of smaller manufacturers' adoption and use of information technology and eBusiness concepts. Those studies showed that smaller manufacturers were being slower to adopt IT and eBusiness than larger companies. While they realized the importance of using the Internet to share and exchange information with their customers, they did not fully realize the benefits and rewards that can be achieved by the use of the Internet for their overall business, sharing information within the company, and sharing and exchanging information with suppliers. As would also have been expected, companies in different industries react/believe differently about the use of the Internet.

How do we reconcile these different views—one that says agility and interconnectedness are crucial to the business, and the other that indicates small businesses and manufacturers are not adopting the tools, techniques, practices, and processes required to be successful in the future? Let's look at some of the requirements.

You will need to understand the factors affecting the development of an eBusiness strategy, the resources required to build an eBusiness foundation, and the implementation of your strategy. It includes things as mundane as claiming a domain name and as complex as conducting business via a well designed website. Along the way, you'll need to monitor and evaluate how well you're doing and be prepared to make changes as the market changes.

What are the specific resources needed by a small manufacturer? First is the technology infrastructure. This includes the personal computers, local area network, server and client software, and TCP/IP connection. Second is the money to support the purchase and customization of software, the acquisition of hardware, training of staff, and possibly the outsourcing of eBusiness services. Third is the time to reasonably deliver on an implementation schedule. Fourth are the personnel to develop and execute eBusiness plans as well as to support in-house and on-line users.

To determine what levels of the above resources you need, ask yourself the following questions:

- Do you have the capacity to fulfill orders in a timely manner?
- How will you handle follow-up customer service?
- What host will you need, after carefully assessing your interaction needs and technology capabilities?

The answers will tell you what you need and whether and how much you should outsource. Regardless of the answers, though, the basic components should be the same.

BASIC COMPONENTS IN THE AGILE ENTERPRISE

To be an agile, connected small enterprise, you need to have some basic components in place. These include the data entry and communications devices (computers, workstations, servers, and/or terminals) that are connected (local area network and wide area Internet telecommunications connectivity). These devices and connectivity should include messaging software (E-mail and/or Instant Messaging), Internet/Intranet/Extranet capabilities (through your Web site) along with any needed financial applications, knowledge management systems, human resource management applications, customer relationship management applications, enterprise resource planning applications, a secure electronic payment system, and any other support services. The applications can be run internally with your own staff, or can be outsourced to any of a variety of service providers. Which you choose depends on your business, your situation, and your level of comfort with outsourcing.

For CEOs of small businesses, there are a number of factors that will influence your comfort level. When considering the what- and how-to-do's, consider the following:

- Be responsive to your business partners. Install technologies that meet your business needs.
- Costs of solutions vary significantly. Invest time in exploring your options.
- High-speed access to the Internet is an enabler. Cable, DSL, and T1 solutions are cost effective and widely available.
- Even though standards are still not clearly defined and software is often first generation, the risks associated with not starting to use eBusiness technologies is far greater than the risks of getting started and needing to modify or upgrade as standards and technologies develop.

TOMORROW'S STRATEGIES

The above discussion of what's needed to be agile is all well and good, but how does it fit into your business strategy? According to a study done for MEP, (Stone, 2004) there are three primary strategies you can adopt to be competitive. The first is to focus on specialized product or process capabilities. In the case of products, this means producing products that have tight tolerances, are difficult to manufacture, or have a critical reliability that no other company can achieve. In the case of process, it means having specialized process capabilities or skilled labor. The second strategy is to develop unique, innovative product or process technology. This means relying on R&D and/or innovation, and constantly renewing your product lines. The third strategy is to target business where proximity to the customer provides a service advantage. This means relying on a logistics advantage (quick turn-around, just-in-time delivery, e.g.) or a design/customer interaction advantage (intensive design or engineering, fashion-sensitive, e.g.). Each of these strategies can lead to competitive advantage, and which one or combination you choose depends on your company and its situation. Each may also require the adoption of supporting strategies to reduce cost and risk, enhance capabilities, and better serve your selected niche. These supporting strategies are directed at targeting the right customers, working to be more cost-competitive, finding lower cost suppliers, developing strategic partnerships, becoming a global player, or diversifying your markets and/or customer base.

If your primary competitive strategy is product- or process-based, what do you need? You need at least the basics.

If your strategy is based on innovation and R&D, you need more than that. Success factors for innovative small manufacturers have recently been identified. (Susman and Warren, 2004) They are:

- Focusing on core knowledge and markets with the intent to dominate a niche
- Avoidance of diversification
- Openness to external ideas and partnerships, with proactive activities to access external opportunities and complementary enterprise resources
- Strategy and execution of a plan to keep close, even informationally intimate with customers
- Having clearly defined intellectual property (IP) and research and development (R&D) strategies
- Open and inclusive corporate culture which embraces innovation
- Provision of a customized service component bundled with products

It may also depend on:

- Innovation in business models in addition to products or services
- Enabling customers to “self-serve”
- Private rather than public ownership structure
- Balanced risk profile of projects and finances

If your strategy is based on superior logistics or design and customer interactions, you need to be informationally intimate. Create and link design tools to customers. Treat them as true partners and integrate as many business processes as possible so it's hard to tell where one company stops and the other one starts. Share people too. Commit yourself to your customers' success.

How are smaller U.S. manufacturing companies currently responding to global competition? A recent study for NIST MEP by Nexus Associates (Oldsman, 2004) looked at exactly that question. The range of options includes establishing plants overseas or purchasing more inputs from overseas to take advantage of lower costs. Most of the surveyed companies reported that they did not plan to open plants overseas. That means that they will have to be successful exporters or dominate a domestic niche. More than half of those surveyed reported that at least some portion of their purchased inputs are sourced from outside the U.S. Those purchased inputs accounted for about a third of all purchased inputs in those companies. They expect that percentage to increase in the next three years, and 25% of those that don't currently source from overseas expect to begin doing so. The increase in purchased inputs indicates that U.S. producers' prices, at least for commodity goods, are not going to be competitive without finding ways to take advantage of lower overseas prices. To give you a sense of how great the difference is, the surveyed companies reported that they would need price reductions to keep the business in the U.S. (the amount by which the U.S. supplier would have to

lower its prices) by anywhere from 5 to 90%, depending on product and industry. Even with continuing improvements in labor and machine productivity, that's hard to do.

CONCLUSION

Becoming an agile enterprise with the ability to respond quickly and effectively to changes in the global business environment is a business necessity. That means adding the tools, techniques, and technologies to your small business' operations. Which tools, which techniques, and which technologies depends on your customers and markets. Get closer to your customers. Find out what their real needs are. Add services to what you offer. Make yourself indispensable.

Ask yourself, what value do I bring to my customers? Is it in design, service, being close to the market, or something else? If you make a product, take a good look at the ones that require tight tolerances, are difficult to manufacture, or have critical reliability requirements. Look at the processes used to make them. Are they unique processes, or do they require specialized, skilled labor that gives you an advantage? Are the products themselves unique and protected by patents? Are you doing the research and development necessary to stay ahead of the game? Are the products fashion-sensitive, and can you customize and deliver them quickly enough (and profitably enough) to take advantage of rapid changes in such a market?

Having asked yourself these product and service questions, now ask yourself about your customers. Do you have the right customers? Are they looking for just the lowest price or can you offer something more? Do they want to Buy American? How many different customers do you have, and should you have greater diversity in your customer base? How much of your business and profits comes from the top 20% of your customers?

Next, ask about your company's operations. Are you as cost competitive as you can be? Should you have your own overseas sources to get the lowest costs possible? Should you become a global player, and, if so, do you have the wherewithal—financial and personal—to change and grow your business enough to be one of those players?

Using the answers to those questions, then invest in and restructure your business to become as agile as possible, and be positioned to take advantage of opportunities as they become available.

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13

IT AND THE AGILE GOVERNMENT



The Role of Information Techonology in Improving the Efficiency of Government Functions

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This chapter will use Pennsylvania's State Government to illustrate how governments must respond to the challenge of becoming an agile organization. The PA State Government is made up of 43 separate agencies, serves over 12 million people, and oversees a \$52 billion budget of state and federal expenditures. To work with maximum efficiency and effectiveness, the state has to be able to respond quickly to a changing environment. The challenge is how to achieve agility given the complex and somewhat cumbersome structure of government.

INTRODUCTION

The topic of agility in government may seem at first like an oxymoron, but that is exactly what must occur for governments to continue to meet the dynamic needs of its citizens.

Governments are unique in many ways. First, governments must serve all citizens, while businesses have the ability to stratify its customers, government

cannot do that. In fact, governments are entrusted to fairly and equitably administer the laws and rules of that jurisdiction.

Second, most government decisions of are very public. Press, citizens, legislatures, and courts have visibility into the decision-making process. Major corporations do not have the same scrutiny and transparency of their decisions.

Third, government must consider the needs of all stakeholders in making decisions and in fact, these stakeholders often play a role in influencing the decision. Legislative priorities, court decisions, lobbyists, business needs, public interest, citizen's needs, and environmental impact, are a few examples of factors that impact the decision-making process. This type of inclusive process requires time to understand the perspectives involved and to reach a workable solution. Therefore things in government often move slower than private industry for a reason to ensure the solution meets the needs of the citizens.

Fourth, government does not sell anything; its primary source of revenue is its tax base. Therefore government funding is reliant on the satisfaction of the taxpayers, who fund the numerous programs through their tax payments. This limits the ability of governments to make capital/strategic investments as readily as private industry. In private industry, the organization is more flexible and dynamic with funding its strategic initiatives. Most good ideas that will increase profit get funded. The simple reality in government is that often good ideas must wait because there is not enough "seed money" to fund the productivity enhancing initiatives.

Fifth, few businesses experience the amount of executive level turnover as governments experience every four to eight years when a new administration takes office. This leads to changing priorities and varying resources across initiatives. It also leads to unfinished business across administrations, which means initiatives are susceptible to changing political agendas.

CUSTOMER DRIVERS OF AGILITY

Despite these differences, government's customers demand agility for several reasons including:

- *Services to all its citizens.* Citizens demand services online and also through more traditional service approaches such as field offices, telephone calls, or waiting in line. These multiple expectations require the government to provide a multitude of customer service options to meet the expectations of the citizens.

- *Effectiveness.* No one likes to pay taxes and no one certainly likes to hear of government waste or bloat. Citizens expect that governments will be effective stewards of their tax dollars.
- *Changing demographics.* Younger Americans have grown up with the Internet and it is part of their life. Their expectations of service, privacy, and other critical topics are very different from many senior citizens. As the population demographics continue to evolve, this generation of Americans will want to see the same level of integration of government services as they see from traditional businesses.

AGILITY BARRIERS

Earlier this chapter outlined many of the unique situations government faces. Many of these situations can be barriers to agility. Some of the specific barriers include: budgeting, human resource practices, turnover of leadership, large-scale projects, regulations and laws, and organization “stove pipes.”

- *Budget.* Government budgets are often prepared 18-24 months in advance of spending. This type of budgeting process can lead to a mismatch of funding vs. priorities as priorities can change in government over that amount of time. An agile organization must address this financial issue.
- *Human Resource Practices.* Government hiring practices are often governed by external factors such as legislative mandates, to Civil Service procedures and union contracts. These programs require advanced planning of hiring needs and can limit the organization's ability to be flexible in how it deploys its work force.
- *Turnover.* Government faces turn over in many ways. In the next 5 years as much as 30% of the existing government work force could retire. This will have a significant impact on government planning, operations, and work force issues. Additionally every 4-8 years, the Administration changes which can lead to instability in the mission and agenda of the organizations. Every transition requires relearning and reselling of existing programs and projects.
- *Large-Scale Projects.* There are very few small projects in government, especially in a state like Pennsylvania with 12 million citizens. Large projects have a series of unique challenges, but most importantly keeping them on track and within scope is a must. Large projects can limit agility because so many resources must be committed for 3-5 years to complete

a project that the organization loses the ability to respond to other urgent situations without impacting the original project time line.

- *Laws, Court Rulings, and Regulations.* – Governments are subject to a wide variety and significant number of laws, rules, and regulations that govern their actions. Over time, some of these rules and laws can become restrictive to effectively sharing information across organizations and lead to a less agile organization.
- *Organization Stove Pipes.* – Governments have existed in the United States for hundreds of years. Most governments of today are not structured strategically as businesses would be. Instead, they are structured by historical precedence, legislation, regulations, and court decisions. Government organizations are evolving into becoming more connected, but the simple fact remains that most governments still have organizations with similar missions working independently and not sharing resources, ideas, or solutions.

These are but a handful of barriers faced by government in displaying agility. The challenges are many. However we believe that by following an effective framework, governments can begin to overcome these challenges.

THE AGILITY FRAMEWORK

The diagram below outlines an agility framework. There are eight areas that must be integrated to facilitate an agile organization.

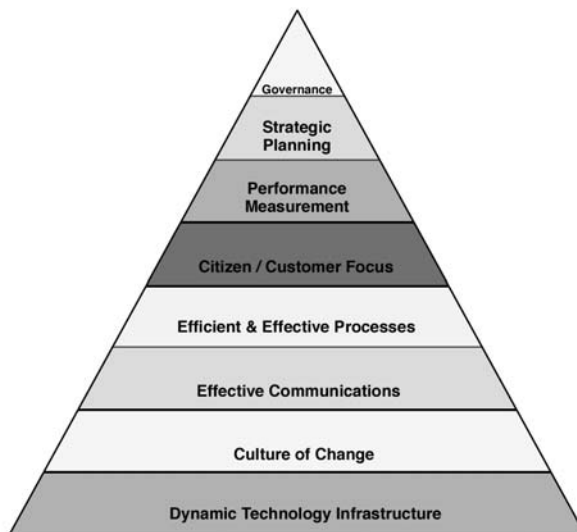


Figure 1. Agility Framework

The Agility framework outlines the following key areas: Governance, Strategic Planning, Performance Measurement, Citizen Focus, Efficient and Effective Processes, Effective Communications, Culture of Change, and Dynamic Technology Infrastructure.

Governance. An agile organization must have an effective decision-making structure that oversees the prioritization of activities, the implementation of key projects and provides the appropriate support and resources to the critical needs of the organization

Strategic Planning. Dynamic organizations must know who they are and where they are going or they are certain to have organizational units head in different directions. Agile organizations must have a well-defined mission and sense of purpose for the organization. This mission must guide the decision-making process and the day-to-day operations of the organization. Additionally, a motivated work force must understand (and help establish) the priorities of the organization. These priorities must be clear, limited in number, and well defined to ensure that the right challenges are being addressed.

Performance Measurement. Effective organizations know what they want to be and, probably most importantly, they know how well they are doing. Some one once said, “What gets measured, gets done.” An organization must establish a balanced set of metrics that monitor all the key principles that are outlined in its mission and strategic plan.

Citizen/Customer Focus. Governments serve multiple roles but one of the most critical is serving the citizens. Often what governments fail to realize is that the work that they do is for the people. Government officials must take the attitude that government expenditures must be made prudently because it is not the Government’s money! It is the taxpayer’s money. Therefore most services that the government provides should be done with the public’s service in mind.

Efficient and Effective Processes. A successful organization is always trying to get better. Whether it is streamlining operations, delivering more service, or reviewing the effectiveness of programs, understanding the strengths and weaknesses of existing processes is critical to becoming an agile organization.

Effective Communications. Agile organizations communicate. A motivated work force is critical to getting things accomplished, but without communications a motivated work force can create redundancies, inconsistent decisions, and

animosity among members. Every organization must remember to communicate, communicate, and communicate.

Culture of Change. A critical component to achieving agility is to have a highly functioning work force that embraces a culture of change. Often governments are perceived as moving slowly and being a place of stability. In fact, many government cultures foster this type of approach. However to be truly effective, organizations must reward people who lead and support change. Governments must attract excellent talent that is motivated to improve services to citizens and embraces change. Without this type of culture and talent, your organization will not achieve agility.

Dynamic Technology Infrastructure. The last component to achieving an agile organization is to provide the technology infrastructure that allows an organization to accomplish each of the above components. Technology must be stable in that service must continue to be delivered through change. Yet, technology must be dynamic to embrace the changing business requirements and expectations of our customers.

We believe that this agility framework is pertinent to all organizations. But for purposes of this chapter, we are focusing on how the agility framework is being applied across the technology community for the Commonwealth of Pennsylvania.

THE PENNSYLVANIA TECHNOLOGY CASE STUDY

When asked to write this chapter, we struggled on how to depict the change that is occurring across the Commonwealth. We are certainly not yet an agile technology organization, but we are striving to become one. In fact 18 months ago, there was only one component of the agility framework that was in check the Technology Infrastructure. The Commonwealth's IT infrastructure is stable and meeting the needs of agencies and citizens today. Functions like mainframe processing, network services, telecommunications, e-mail, and back office business processes (accounting, payroll, budget, procurement, human resource systems) are all stable.

However, many of the other components of agility were not being addressed at an enterprise level. For the past 18 months, we have begun working on creating the Culture of Change to continue to allow the Commonwealth technology organizations to become more agile.

The following paragraphs outline the steps that the Commonwealth IT organizations are taking to accomplish our agility objectives.

IT Governance

IT Governance is the process by which IT investments are prioritized across an organization. Full-cycle IT governance begins at the planning stage and continues down to project management and IT operations. While more familiar to business, IT Governance is a relatively new concept for government organizations. The dawn of IT Governance in government means a fundamental change to how government operates. IT Governance enables government to enact agile decision-making processes to align technology investments with Enterprise goals and missions.

Previously, the Commonwealth of Pennsylvania's policy for the governance of IT initiatives was primarily decentralized. It became apparent that this was not an efficient or agile way to manage IT investments and things needed to change.

In April 2004, Executive Order 2004-8 was issued and established an Enterprise Information Technology Governance Board to oversee the investment and performance of information solutions across the Commonwealth's agencies. The Governance Board was tasked with advising the Governor on the development, operation, and management of the Commonwealth's IT investments and resources.

In addition, the Governor's Office of Administration/Office for Information Technology (OA/OIT) was tasked with implementing the policies, planning initiatives, and budget directives adopted by the Governance Board.

The OA/OIT was also directed to:

- Establish an Enterprise Architecture (EA) and deploy enterprise-wide technology
- Establish product standards and conduct technical reviews of agency systems
- Establish enterprise-wide security procedures and protocols
- Develop and deploy Geographic Information System (GIS) and Geospatial Technology (GT) investments
- Review all agency IT budget requests exceeding \$100,000 and other procurement documentation; and
- Establish a Community of Practice (CoP) enterprise-wide planning process

Communities of Practice and Governance

The CoP planning process is an integral part of the Commonwealth's IT Governance structure. CoP brings together agencies with similar program and policy objectives, serve common populations, or have compatible data collection and management needs. Specifically, the Commonwealth's 43 agencies have been integrated into 4 communities of practice: Health and Human Services, Environment, Public Safety, and Government Operations. The diagram below outlines the CoP approach.

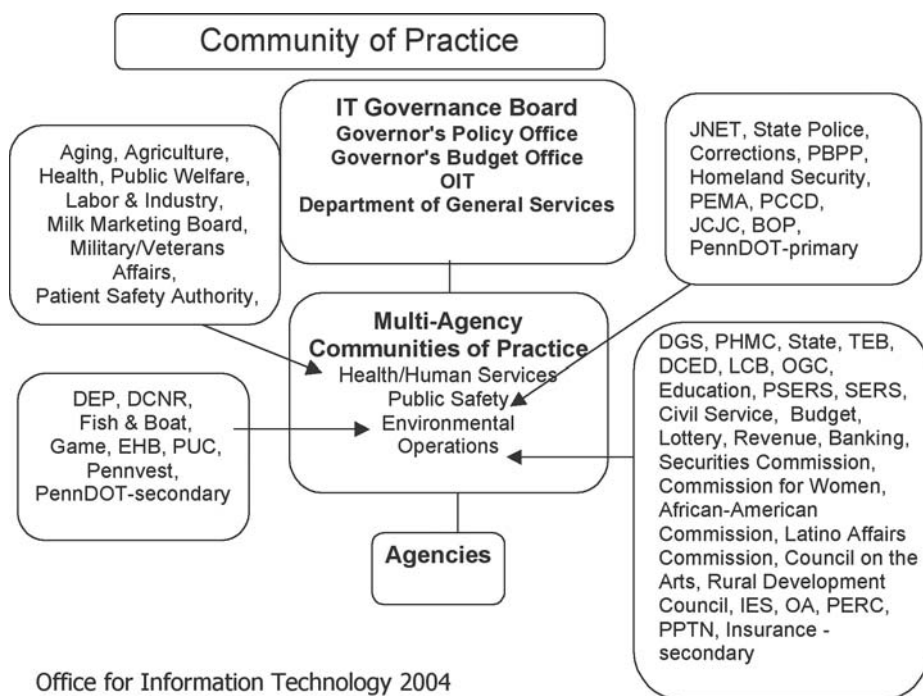


Figure 2. Community of Practice Approach

These communities of practice were derived from the premise that Government serves several basic needs for their citizens: to protect their public safety, to protect their health, to protect the environment, and to educate students. Agencies have been aligned with those basic principles to ensure that technology initiatives in agencies with common missions are integrated as best as possible.

Per Executive Order 2004-8, the CoP process focuses on enterprise IT planning and project prioritization to:

- Ensure that the IT projects funded in the Governor's budget are the most critical and are aligned with enterprise goals. Projects are prioritized within each community of practice for budgeting and planning purposes; and
- Identify similar projects being addressed across multiple agencies and plan for the development of these initiatives in a collaborative, non-redundant manner. This analysis can identify where solutions can be reused or where agencies can work together to solve a business need rather than working in their stove pipes.

In the end, Pennsylvania's development of an agile IT Governance structure will greatly improve organizational efficiency, result in cost savings, and better serve its citizenry.

Strategic Planning

With an effective governance model in place, the Commonwealth created the *Keystone Technology Plan*, the strategic technology plan for the Commonwealth. This plan outlines our IT mission and guiding principles, explains the governance model, explains the role and function of the central IT organization, discusses enterprise architecture,¹ and outlines 3-year priorities for each community of practice. The *Keystone Technology Plan* provides the basis for broader planning across the agency technology organizations. Each technology organization is to review the central plan and priorities, develop their agency specific priorities,² and develop a strategic plan that integrates into the *Keystone Technology Plan*.

This type of coordinated IT planning has not existed before across the Commonwealth and results thus far have been mixed. Several agencies have embraced the concept and delivered excellent plans, while other agencies are still sorting out their specific priorities with their business areas. This type of dialogue has often not existed previously in some agencies where technology is considered a back office administrative function.

Agency Plans require approval by the central IT office to ensure that all agencies are rowing together with the same set of priorities. Additionally these plans often highlight issues that need to be addressed by the central IT office as being common to multiple agencies.

Having a technology strategic plan emphasizing customer service, efficiency,³ and IT prioritization is a critical step in helping a motivated organization attain its goals.

IT Projects Must Measure-Up

The most important thing that any organization (agile or not) can do is to deliver on its promises. While IT helps improve the functions of government by making it more agile, it is important that tools are available for evaluating the IT projects.

Performance measures are customer-focused, quantifiable indicators that provide government agencies with information on whether or not they are meeting their goals and objectives and, essentially, delivering on their promises. Performance measures also give agency managers a greater capability to plan, budget, and structure organizational activities and to control results.

In establishing the Commonwealth's enterprise-wide IT policies, standards and solutions, timely delivery of efficient projects has become increasingly critical. The IT community is focusing on delivering proven, measurable benefits to reestablish and maintain credibility in the value of IT within state government.

A commitment to accountability is necessary to receive IT project funding approval and, overall, to achieve real results. Before any new IT project can begin, a business case must be established. As IT projects are completed, they must be measured against the original business case that was projected. It is the responsibility of state agencies to ensure that procurement of IT resources – hardware, software, personnel and services – is done in alignment with agency objectives. And furthermore, it is the central technology office's responsibility to ensure these IT projects are in alignment with meeting the overarching obligations of state government.

Focusing on Customer Service is Key to Success

The focus of successful IT efforts in state government is the continuous improvement in providing critical services to customers. In this case, that would be the citizens of the Commonwealth. It is imperative that agencies recognize this and organize themselves in a manner that makes the needs of the citizens central to their functions. A citizen-centric government does not act as "big brother" but rather as an easily accessible service provider.

By taking advantage of Internet technology in delivering information and services, government has made great strides in improving its access and services. Pennsylvania has quite an impressive list of online services, including: filing tax returns, registering motor vehicles, obtaining new business licenses, sharing criminal justice data, and applying for various human services.

One good, and frequently used, example of this is provided by the Pennsylvania Department of Transportation (PennDot) where citizens can go online to obtain

all the information pertinent to drivers licensing and vehicle registration. As a result of this, PennDot has progressed from being an agency that citizens were historically unhappy with to one for which citizens express much satisfaction.

The PA PowerPort, the Commonwealth web site,² is another example of how IT has enabled government to be more responsive, and therefore more agile, to citizen needs. The PA PowerPort is the main web portal through which citizens can obtain access to information and services from any state government agency. Instead of having to go to the web sites of various agencies, this portal provides “one stop shopping.” Information from all 43 state agencies is available through simple navigation processes and the use of key word searches.

As more and more information goes online, electronic government services continue to evolve and are more readily available around the clock for convenience. Technology has certainly helped to create a better delivery of customer service functions and essentially has provided more citizen satisfaction. However, to truly transform government, agencies must view government as citizens view government. The next big IT challenge is to create a truly interactive experience by establishing electronic citizen accounts. This would enable citizens to sign-on to the PowerPort under a specified identity, just as they would to do their online banking or shopping. Once an identity is verified, individuals would have access to a menu of all government online services through one single view. With the click of the mouse, citizens could take care of all their government related business in one easily accessible location. This type of streamlined, interactive customer service is certainly the wave of the future for agile governments.

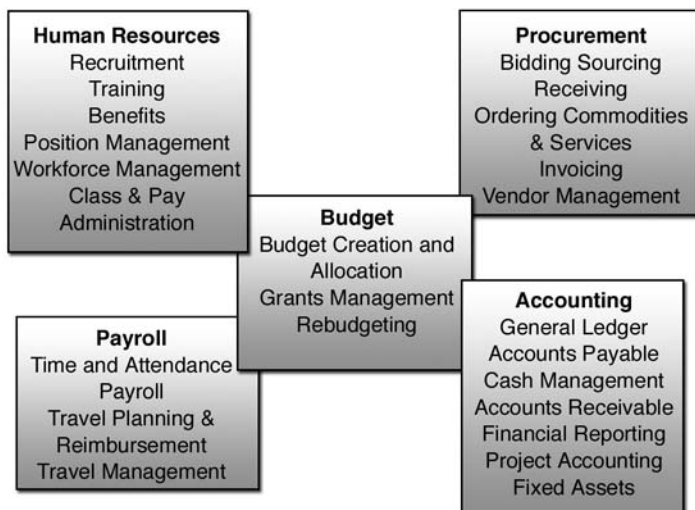
Being Efficient and Effective is Always a Process

Given today's environment of budget limitations, it is imperative that government should organize its functions in the most efficient manner. The focus should move from being agency-centric to a more centralized, enterprise-wide management system. This requires constant collaboration and coordination between the various agencies, which is always a challenge.

Pennsylvania recently met one of its biggest challenges in centralizing its business functions across state government. During the past few years, a number of state administrative offices requested upgrades to their computer systems used for managing their main business functions. Rather than address these requests individually, it was determined that significant advantages and cost savings could be gained by responding in a more coordinated fashion with a view to long-range benefits. This idea eventually became the Integrated Enterprise System (IES).

The purpose of this system is to streamline and standardize business processes

in accounting, budgeting, payroll, human resources, and procurement. Below is an illustration showing how this system is organized.



The Commonwealth chose mySAP.com Enterprise Resource Planning (ERP) software, which incorporates best business practices from around the world, to improve its internal business operations. MySAP.com is the ERP software package the Commonwealth is using to integrate these business processes onto a single computer system.

In each agency there is an IES Coordination Team whose task is to lead and manage IT project implementation within their agency while coordinating with IES teams from other agencies. This helps to ensure that there is constant agency communication and collaboration, which is critical when implementing such a large, enterprise-wide project.

Another key activity of efficient government is a program entitled Strategic Sourcing. Put simply, strategic sourcing looks at what we buy and determines if we can buy it more economically. The concept is similar to the consumer concept of Sam's Club. If you use a lot of paper towels, you go to Sam's Club and buy them in bulk and save a lot of money. The Commonwealth is doing the same thing with how it purchases goods and services. Previously each agency may have had separate contracts to buy commodities or services, thus not leading to best pricing for what we buy. The Commonwealth has been reviewing these contracts and over the past 2 years and has saved over \$100m. This type of program continues to improve how effective government is when it comes to using the taxpayer's money.

Developing a Committed IT Workforce Takes Managerial Commitments

To develop efficient IT-based systems, governments face many challenges. One of the biggest challenges is how to attract and retain a skilled IT labor force in the face of stiff competition with the private sector. Hiring in the public sector is cumbersome, because government often lacks the flexibility to compete effectively when attempting to attract, hire, and retain qualified IT personnel. Through aggressive recruiting practices, improved salaries, and the revision of IT position classifications, Pennsylvania has begun to address this problem. In states such as Delaware and Georgia, civil-service requirements have been waived for certain IT job classifications. The Commonwealth of PA is studying models to increase future effectiveness.

Also, the Commonwealth has begun to place greater emphasis on professional development by providing workshops and on-line training courses for IT professionals. Employees working in IT need to keep their skills up-to-date and to work on challenging projects; therefore, we need to invest in them. But in order to achieve a return on this training investment (and investments in infrastructure and systems), well-trained employees must be retained within the Commonwealth's complement, and their training needs to be aligned with the State's evolving IT Enterprise Architecture standards.

Consistent Communications is Critical

Most organizations have great goals and objectives and even excellent strategic plans for meeting them. But without a strategy for clearly communicating goals and plans, it is doubtful organizations will get very far. Consistent communications with all key stakeholders is critical to being an effective government organization.

Pennsylvania's central IT office, best known as the Office for Information Technology (OIT), took the time to create an organizational communication plan and constantly works at executing that plan. Included in the plan are key messages that were derived from the organization's overall guiding principles. These messages are tailored to each audience within the organization.

In addition to having clear and consistent messages, it is important to communicate them often. Pennsylvania is achieving this through many vehicles, including: websites, a quarterly newsletter, quarterly staff meetings, monthly meetings with agency Chief Information Officers and IT Managers, and regular email notifications with timely updates. Not only are messages going out, but

feedback is encouraged. Listening to the comments—which can sometimes be criticism—and actually acting on that advice, is what truly makes Pennsylvania agile.

CONCLUSION

The process of setting up government IT systems and organizations to achieve agility is an arduous process. A long list of challenges such as limited budgets, leadership turnover, restrictive regulations, and retention of manpower continue to make the process a challenging one. To effectively use IT to achieve the long-term goal of agility, government organizations need to be aware of these barriers and be willing to meet these challenges.

The example of Pennsylvania's State Government structure demonstrates how government can use IT to improve the efficiencies of its functions. By embarking on a systematic process to integrate agency functions and to encourage inter- and intra-agency collaboration and communication, the state has improved service delivery to its citizens. This is a route that other governments—local, state, and federal—are taking towards a more agile future.

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About the Contributors

Nirmal Pal is Executive Director of the eBusiness Research Center at The Pennsylvania State University, which fosters research in e-business strategy, management, and marketing to improve business operations. He assumed this role in February of 2000. Before joining the University, he was Director, IBM Global Services Consulting Group, White Plains, NY. As a part of a distinguished 39-year career at IBM, he directed IBM's e-business consulting practice worldwide and worked closely with Fortune 500 clients on e-business strategies. His IBM network of e-business consultants worldwide were engaged in many consulting engagements with major organizations to help them with e-business, e-commerce, Intranet/Extranet, and other Internet related activities. As one of the leaders of IBM's e-business consulting activities, he was responsible for business development in this space, as well as development of supporting analytics/methods/tools and other intellectual assets for this new area of consulting and services. He has been a member of IBM Consulting Group's management team since its' inception in 1991 which helped grow the business for this unit from zero to over one billion US dollars, and from zero to over 5000 consultants, in just seven years. He holds degrees in Electrical Engineering and Computer Science.

Daniel C. Pantaleo started his career with 25 years in higher education as a faculty member, Fulbright Scholar, Dean, academic vice president, and Provost, and was followed by four years as Vice President for Product Development with an interactive multimedia education and training developer. Dan left that post in 1997 to assume the responsibilities of Program Manager for SAP America's University Alliance Program where he has been able to apply his knowledge of higher education and interactive software to significantly develop the Program. Expanding his responsibilities, he was then appointed as Director of Higher Learning Initiatives for SAP America with responsibility for several higher learning projects including the University Alliance Program throughout all the Americas. Dan was then appointed to lead the SAP Institute for Innovation and Development as Vice President. The Institute has responsibility for research and application projects, an Executive Education program, and the University Alliance program. Dan has recently been appointed to lead the Strategic Issues group for SAP, AG.

Janet Caldwell is the founding Director of IBM's Institute for Electronic Government, hosting over twenty thousand high-level government leaders since its inception. She directs a robust research agenda with renowned academic and practitioner partners and has produced over 200 Web casts featuring talk shows, mini series, and interviews with prominent guests. She serves on the Harvard Policy Group, Advisory Panel for the Congressional Management Foundation, Advisory Board for the World Bank Global Development Gateway, and is a member of the Editorial Board for the Journal of E-Government. She is an active principal with the Council for Excellence in Government. She has published numerous papers and co-authored several books.

Earlier in Ms. Caldwell's IBM career, she authored the consulting methodology and case studies for change management consultants and deployed education to Brussels, New York, and Hong Kong. Prior to joining IBM, Ms. Caldwell was the Director of Strategic Management at the County of Fairfax, VA. Her approach to county-wide change won national recognition at Harvard University, the John F. Kennedy School of Government's Strategic Computing and Telecommunications in the Public Sector. Ms. Caldwell holds an MBA and a BA in sociology.

Dave Cranmer is a senior researcher in the Manufacturing Extension Partnership's (MEP) Manufacturing Futures Group at the National Institute of Standards and Technology (NIST). With MEP since 1993, he has conducted research on innovation, supply chains, technology road mapping, e-business and exporting, built a business-to-business marketing consulting practice for smaller manufacturers, and established specialty consulting practices in financial access and e-business. In addition, he has developed a set of technology/product development services for smaller manufacturers. He is also the President and CEO of Phase 3 Consulting LLC. Phase 3, founded in 2001, provides B2B marketing, marketing and technology management, and technology evaluation services to small and mid-size companies.

Prior to joining NIST, he has been a member of the technical staff at the Aerospace Corporation as well as the Bendix Corporation's Advanced Technology Center, conducting R&D on ceramics for a variety of applications. Dave holds a PhD and SM, both in ceramics from M.I.T., a BS in ceramic science from Penn State (cum laude), and an MBA from Heriot-Watt University. He is a Fellow of the American Ceramic Society, and a member of Keramos and Sigma Xi. He is a co-holder of two U.S. patents, and has published over 50 papers and edited one book.

Brian Geffert is a Principal with Deloitte's Security Services Group in San Francisco, CA with over 14 years of experience with information security and privacy assessment, design, and implementation across various industries. Brian

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Fred Heller is vice president and general manager, Xerox.com, for Xerox Corporation, Stamford, CT. He was appointed to this position in July of 2001. The Xerox.com organization is responsible for the strategy, development, and operations of Xerox's global customer site, www.xerox.com. The primary objectives of this group are to drive revenue through all channels with persuasive online experiences, and to simplify customer access to account information. The group provides online capabilities to many countries in 10 languages. Heller joined Xerox in 1994 in Corporate Business Strategy in Stamford, CT. Prior to joining Xerox he worked in management consulting, product management, and marketing for mostly smaller companies in the Silicon Valley and the New York areas.

Heller received his BS in Computer Engineering from the University of Michigan in 1981 and an MBA from Harvard in 1989. He is a board member of the Soundwaters, an environmental education non-profit organization based in Stamford, CT and a member of the advisory board of the eBusiness Research Center, Pennsylvania State University.

Ravi Kalakota is the CEO of E-Business Strategies, an IT research and strategy firm. A leading authority on business technology trends and strategy, he has consulted with start-ups and Fortune 1000 companies and written nine pioneering books on e-commerce, e-business, m-business, and offshore outsourcing. Two of his books are considered by Amazon.com to be "e-commerce classics." His most recent book is: *Offshore Outsourcing—Business Models, ROI and Best Practices* [Mivar Press, 2005]. Previously, Dr. Kalakota served as the Georgia Research Alliance (GRA) Chair Professor at Georgia State University. He also held the Xerox Chair in information systems at the Simon Graduate School of Business, University of Rochester, and has taught at the University of Texas at Austin.

Vince Kasten is a Managing Partner, leading Unisys Global Transformation. His 25-year career includes business and IT strategy, operations, business process improvement, commercial software product development, and research & development. His former affiliations include:

Starting with Bell Labs where he specialized in operation systems and UNIX development, he eventually became the Director of the High Performance Transaction Technology Group where they leveraged new technologies for use in scalable business and network operations systems. He continued on to Lucent Technologies, specializing in large scale system integration. Prior to his current position Vince was a Managing Director at BearingPoint (formerly KPMG Consulting) where he was responsible for an eclectic services mix, including business strategy, large scale systems development and integration, and application architecture. He also drove key internal projects, including consolidation of BearingPoint's global solution development. Vince holds three U.S. Patents, and has authored or co-authored several books and over 40 papers and articles on the subjects of enterprise alignment, business and IT partnership, enterprise project management, service level engineering, network and systems management, and performance analysis and capacity planning. Vince received his MS in Computer Science from Columbia University, NY.

Mathias Kirchmer is CEO of IDS Scheer North America, the leading provider of business process excellence solutions. Dr. Kirchmer is a member of the Extended Executive Board of IDS Scheer AG, and also heads up the Japanese operations of IDS Scheer. He is an affiliated faculty member of the Center for Organizational Dynamics of the University of Pennsylvania. He is also member of the curriculum advisory board of Widener University and St. Joseph's University in Philadelphia.

Dr. Kirchmer has been instrumental in designing and implementing business processes, as well as directing numerous business process improvement initiatives, including multiple process-orientated software implementations. After joining IDS Scheer in 1990 as a consultant, he successfully executed multiple business process management projects, including multiple SAP software implementations. Since 1993, he had been responsible for standard software implementation consulting activities, with a focus on SAP. Since 1996, Dr. Kirchmer has served as President of IDS Scheer North America playing a pivotal role in building the company's North American operations into a leading center for business process excellence. Dr. Kirchmer graduated from the Karlsruhe Technical University in Germany, with an MA in Computer Science and Business Administration. He also holds an MA in Economics from the Paris-Dauphine University in France. Dr. Kirchmer obtained a PhD from the Saarbrücken University in Germany, for his research concerning the business process-orientated implementation of standard software packages.

Michael Lim is the managing director of Grey Insights, a firm specializing in Internet strategy and consulting services. He is also the marketing director in

resident at VirtualStorageCenter, a technology company focusing on research, development and commercialization of web-based and next generation mobile storage technology. Previously, he worked as the business development manager at Icfex, where his responsibilities included marketing and implementation of Internet-based tendering system and Citadon's ProjectNet solution in commercial construction companies. Before that, he gained research experiences in e-commerce policy development field at the Multimedia Development Corporation, the lead agency overseeing the development of the Multimedia Super Corridor in Malaysia and the e-University initiative at Universiti Putra Malaysia (UPM). He has contributed to the Technopreneurs Association of Malaysia, Management Science/Operations Research Society of Malaysia and the Center for Information Management and Policy Action at UPM. His coauthored article appeared in the Annual Review of Management Science and Operation Research. He received his bachelor science degree in agribusiness from the Universiti Putra Malaysia, Malaysia.

Munir Mandviwalla is currently the Founding Chair and Associate Professor as well as the Executive Director of The Irwin L. Gross eBusiness Institute at the Fox School of Business and Management, Temple University. He has also been given the prestigious position of a CIGNA Research Fellow. His research interests include collaborative systems and communication technologies, the role of technology in large-scale professional meetings, electronic commerce strategy, and the use of prototyping for theory development. Dr. Mandviwalla also consults on electronic commerce and business strategies and implementation. Munir has published more than 40 articles in scholarly journals and international conferences. He is also on the editorial board of several international journals and recently served as the program chair of an international conference on the information technology workforce.

Dr. Mandviwalla's work has been supported by grants totaling approximately \$2 Million from many Fortune 100 companies. In 2000, IBM selected him for their Faculty Partnership Award, a prize of \$40,000, in recognition for contributions to e-business teaching and research. In 2002, The Claremont Graduate University recognized him with their Alumni Hall of Fame award. Dr. Mandviwalla holds a BS in Systems Engineering from Boston University, an MBA from the Peter F. Drucker School of Management at Claremont Graduate University, and a PhD in Management Information Systems from the Programs in Information Science at Claremont Graduate University.

Diane McGarry is Chief Marketing Officer, Xerox Corporation. She was named to this position in October 2001. She is also a corporate vice president, appointed

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McGarry joined Xerox in 1973 as a sales representative. She has held several sales, marketing and executive management positions in the United States, the United Kingdom, and Canada, including serving as Xerox Canada's president and CEO from 1993-1998. She also was the head of the North American General Markets Group, which included Xerox's agent program and the emerging telebusiness channel.

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Dr. Schuff also has more than five years of experience in supporting, managing, and developing corporate networks including LAN and Internet-based solutions for several large companies in the Philadelphia area.

Samir Shah has been appointed as an instructor in Information Sciences and Technology (IST) at Penn State University (York and Schuylkill branches) since 1999. Shah is teaching undergraduate IST courses such as IT Project Management, IST Integration and Problem Solving, Distributed Team Projects, Web Programming, and Database Management. His current research interest is in the areas of IT project management.

Prior to his Penn State appointments, Shah spent a number of years working for various agencies of the Commonwealth of Pennsylvania. Most recently, he served as a Chief of Information Systems with the Department of Conservation and Natural Resources. Prior to that, he held Computer Systems Analyst positions with the department of Labor & Industry and the Pennsylvania Liquor Control Board. It was through these positions that he garnered expertise in a variety of skills including IT project management, IT strategic planning, IT training, and large IT application development projects. He received his Master of Engineering in Engineering Science degree from Pennsylvania State University, Harrisburg.

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Jelena Spanjol is assistant professor of marketing at Texas A&M University. She received her PhD in Business Administration from the University of Illinois at Urbana-Champaign. Spanjol's research interests include product markets dynamics, innovation and product portfolio management, as well as organizational and managerial cognition in marketing strategy. Her research has been presented at various international conferences and published in marketing and management publications, including the *Journal of Marketing*, *Journal of the Academy of Marketing Science*, and various book chapters. Before entering academia, Spanjol worked in the scientific software industry in international marketing and business development, both in the U.S. and Europe.

Arthur C. Stephens was appointed Deputy Secretary for Information Technology for the Governor's Office of Administration in the Commonwealth of Pennsylvania in March, 2003. He has over 15 years of experience in working with state government agencies and private sector financial institutions. He has skills in all phases of the systems development life cycle and specializes in IT strategic planning, business process reengineering, large systems development, and organizational design projects.

Mr. Stephens worked with Deloitte Consulting from July, 1997–February, 2003 as a senior manager and principal. As a principal with Deloitte's public sector information technology practice, he was responsible for the entire business: sales, project delivery, human resources, public relations and community service. He led Deloitte's health and human services practice, focusing on the departments of Public Welfare, Health, Labor & Industry, Insurance, and Aging. Prior to his Deloitte appointment he was a project manager for Andersen Consulting (now Accenture) from July, 1987–July, 1997 where he focused on Revenue and Insurance systems. He also managed projects focusing on personal and commercial insurance. He holds a BS in Finance from the Pennsylvania State University.

Bill Stephenson is a member of Hewlett-Packard's IT Strategic Services practice where he advises and assists clients on business and technology practices to design and implement an adaptive enterprise. Bill is a business-oriented technologist with over thirty years of experience focused on developing the Business/IT Architecture to address the changing business environment, and aligning the IT strategy with the business strategy.

Prior to joining Hewlett-Packard, Bill served as the regional IT partner in charge for Ernst & Whinney, National IT Director for Grant Thornton, and the Senior Vice President/CIO for an international software company. Bill holds an MBA from Michigan State University and a BA from Youngstown State University.

Mark Turrell is the CEO of Imaginatik, the leader in Innovation and Idea Management software. He has worked with over 300 companies on innovation management, related topics of knowledge management, and collaborative technologies, many of them Fortune 100 businesses. Prior to co-founding Imaginatik in 1994, Mark worked at Intel and General Motors. At Imaginatik he has been involved in all of the major products and processes developed by the firm, including Idea Central®, the award-winning Idea Management software and process in use by over 100 organizations worldwide. In 2001 he opened the US headquarters office in Boston, and initiated the Imaginatik Research group which is dedicated to fundamental research in corporate innovation.

He is a frequent speaker on Innovation and Idea Management and is widely recognized as the leading authority in the field of Idea Management, with numerous magazine articles and white papers on topics such as idea evaluation, reward and recognition, collaboration, and intellectual property protection. Mark is a Research Fellow at Penn State University and lectures at several business schools including Cass School of Business (UK), INSEAD (France), Vanderbilt University Owen Graduate School of Management, and Harvard Business School.

Michael Uram is an Adaptive Enterprise Program Director at Hewlett-Packard. HP's Adaptive Enterprise program is focused on helping clients improve business agility by synchronizing business and IT to capitalize on change. Michael leads the Adaptive Enterprise program in the central U.S., working cross-division within HP with corporate and enterprise clients and their HP account teams to structure strategic IT improvement initiatives. He is co-developer of the Adaptive Enterprise Maturity Model used to help clients develop customized Adaptive Enterprise roadmaps specific to their business.

Prior to the Adaptive Enterprise role, Michael was HP's lead Solution Architect for a major U.S. airline. Before joining HP in 1992, he was a data center manager and systems administrator at McDonnell Douglas Research Labs in St. Louis, MO. In addition to his data center duties, he specialized in porting and optimizing computational fluid dynamics simulations for the company's supercomputing environment. Michael was a member of the National Unix practice at Prime Computer and Regional Unix lead at Unisys. In 1982, Michael served a graduate internship at IBM, Boca Raton in the Custom Programming Division. He started his IT career as a Computer Science Instructor in Kuala Lumpur, Malaysia. Michael holds a MS in Computer Science from Southern Illinois University and a BS in Elementary Education.

Anthony Warren (Tony) began his career with three years as the head of a multinational program in magneto-hydrodynamic power generation. He joined a start-

up that created and executed new product strategies for major corporations based on a broad range of technologies. As this company, PA Technology, grew rapidly, Tony was responsible for the international operations setting up divisions around the world. In 1987, Tony co-founded and raised the capital for a 10-year Limited Partnership to create and develop early stage technology-based companies that helped over 100 companies commercialize proprietary technology. In 1999, he co-founded Strategic Technologies LLC, a boutique investment bank undertaking transactions for corporations with significant intellectual property assets. He is also a venture partner in Adams Capital Management, a nationwide VC firm headquartered in Pittsburgh with over \$700 million under management.

Dr. Warren joined the SMEAL College of Business Administration at Penn State as Director of the Farrell Center for Corporate Innovation and Entrepreneurship, and the Farrell Clinical Professor for Entrepreneurship in 2001. He was recently invited to join the National Innovation Initiative, a joint program between industry and government to create an agenda for the U.S. to continue to prosper through innovation in the 21st Century. He received his BS (1st Cl. Hons.) and PhD at the University of Birmingham, (UK) followed by post-doctoral research at the Universities of Toronto and Illinois.

Ralph Welborn has positioned himself as the *tip of the spear*—identifying and driving strategic initiatives and transformation—whether this includes exploiting markets and innovation disruptions, creating new revenue and growth opportunities, creating large-scale client transformation programs, facilitating market positioning and/or solution development, and deployment into new markets. Though focused on financial services, his experience over the last 10 years has been across industries, seeking patterns across these industries to exploit the implications within them.

Ralph began his career as a research fellow at Boston University in their University Professors Program and the Center for Technology Policy where he focused his research analyzing issues concerning regulatory impacts on economic development, public policy, and developmental economics. Part of this position involved consulting with the International Labor Office, which led into a career with positions at a variety of consulting groups, beginning with Coopers & Lybrand's advanced technology group, through Charles Schwab & Co., Inc., Cornerstone Consulting group, and then BearingPoint (formerly KPMG Consulting). At BearingPoint he started as the Director of Electronic Commerce in 1997 and by 2000, became the Senior Vice President of Global Solutions where he was responsible for their solutions both globally and across industries. Ralph was most recently appointed to be the Managing Partner and Vice President of the Global Transformation Team at the Unisys Corporation. There he is

responsible for strategic initiatives, thought leadership, and development of new revenue streams from clients. He has published numerous papers and co-authored several books and has been frequently invited as a speaker at conferences around the world. He received his BA and MA in Comparative Public Policy (*summa cum laude* with distinction, *Phi Beta Kappa*) as well as his PhD in Philosophy of Science and Technology from Boston University.

Jacqueline Zinn is a professor in Healthcare Management, Department of Risk, Insurance and Healthcare Management, Fox School of Business and Management at Temple University, Philadelphia PA. She teaches strategic management and health care administration. Her research has examined the influence of market competition on quality and access in hospitals, nursing homes, and home health agencies. She has investigated the association between organizational characteristics and quality in health care settings, comparing severity-adjusted outcomes of care. In the field of laboratory medicine, she has explored the application of various consensus development techniques to evaluate laboratory performance. She is the 1996 recipient of the John D. Thompson Prize for research achievement, and is a 1997 co-recipient of a Robert Wood Johnson Clinical Investigator Award. Dr. Zinn is an adjunct fellow of the Leonard Davis Institute for Health Economics and a Fellow at the Institute on Aging, University of Pennsylvania. She is a past chair of the Healthcare Management Division of the Academy of Management.

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