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INTRODUCTION

“Dammit Jackson, if you don’t have time to do it right the first time, how do you expect to have time to fix it later?”

Thus, in 1969, began an education in Enterprise Excellence in the U.S. Air Force—albeit unknowingly at the time.

SGT Harry Jackson USAF

The challenges facing business and industry are unparalleled in history: uncertainty associated with the war on terrorism, failing confidence in business leaders, dynamic global marketplace, skyrocketing energy costs, shrinking budgets—and the list goes on. These challenges have led to “management by best seller”: grasping for the silver bullet that will solve immediate problems and enable the enterprise to meet monthly or quarterly numbers. Yet some avoid the “silver bullet paradigm” and continue to prosper and thrive (e.g., Toyota, General Electric, and U.S. Army Armaments Research, Design and Engineering Center, a 2007 Malcolm Baldrige National Quality Award Winner).

Government agencies, like business and industry, face the same challenges; however, these are compounded by shrinking budgets, broadening commitments, legacy systems maintained long after their planned life, unrealistic financial and schedule pressure to meet milestone commitments, and the ever-present urgency to satisfy constituents. The military environment is further complicated by the need to maintain systems and equipment, often beyond its intended life and, with the war on terror, beyond the intended tempo of operation. As in business and industry, some government agencies have also resorted to “management by best seller,” seeking the silver bullet. All of these organizations are searching for a quick resolution to problems and situations that have been years in the making and are supported by well-entrenched cultures and bureaucracies.

LAW OF UNINTENDED CONSEQUENCES

The serious challenges facing business, industry, and government require, to paraphrase Einstein, different thinking than that which created them. The silver

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bullet approach focuses on creating immediate savings, not long-term investment for success. This search for the silver bullet makes organizations susceptible to the law of unintended consequences (i.e., unexpected consequences derailing our ability to achieve our intended consequences—our goals).

The law of unintended consequences has been a recognized part of economics, politics, and sociology for centuries. It can, in fact, be found in all aspects of human endeavor. It is the result of not carefully evaluating a course of action and exploring all potential consequences. Robert Merton, an American sociologist, in his 1936 article “The Unintended Consequences of Purposive Social Action,” identified the five sources of unanticipated consequences for human activity.

1. *Lack of knowledge*: Inadequate data prevents accurate identification of consequences. Proper planning requires fact-based decisions. Fact-based decisions can be made only if all possible critical factors are explored, data is collected, and confidence levels for the data are known.
2. *Error*: Data analysis is essential for fact-based decisions. The analysis needs to be accurate and statistically sound or it will provide incorrect information leading to erroneous decisions about consequences.
3. *Imperious immediacy of interest*: The desire for the intended consequence of an action is so great that one purposefully chooses to ignore any unintended effects.
4. *Basic values*: The possibility of unintended consequences is ignored, since the planned action is a direct result of the fundamental values of the decision makers.
5. *Self-defeating predictions*: The knowledge of the prediction of the intended consequence of the action inspires individuals to change behavior and thereby changes the resulting consequence.

These limiting factors are centric to “management by best seller.” Deploying a single program of improvement strategies ignores the interactions of the many factors, systems, and processes of an organization. It focuses on quick fixes to save the day and ignores, or at least trivializes, negative consequences. It also leads to manipulation of results to match the required goals. “We must succeed; therefore, we will declare success for the stockholders, the board of directors, the boss! And we will demonstrate it even if we have to creatively manipulate the numbers.” This approach will always, therefore, appear to solve the immediate need, but will in the long term create an opportunity to look for another “best seller.”

Several methodologies are currently being implemented throughout business, industry, and government that provide significant benefits to their organizations (e.g., Six Sigma, Lean thinking, Lean Six Sigma, theory of constraints, continuous process improvement, and Design for Lean Six Sigma). Some are interrelated, and all aim at doing the right things efficiently and profitably. In most instances, they are deployed to improve operations by reducing costs and

improving cycle times. In some instances, efficiency is sought without regard to quality, which leads to efficiently producing scrap, rework, repair, and increasing customer dissatisfaction. Furthermore this approach unwittingly develops a philosophy of “saving their way” to prosperity, which of course is not possible. This may solve an immediate need, but will in the long run lead to failure. On the other hand, one can spend one’s way to bankruptcy. So, how do we lead our organizations to success?

Many point to Toyota and others as examples of companies to learn from and emulate. The focus is usually limited to the efficiency aspects of their operations, ignoring the other critical elements of their success: Toyota is a great company by all metrics because it sells its way to prosperity . . . it satisfies and delights its customers with cost-effective and efficient operations. The Toyota Production System is an important part of its corporate DNA, but so is the company’s focus on customer satisfaction, the way it develops products and services, and its management and leadership. The Toyota secret to success is a way of thinking that provides long-term focus on satisfying customers in the most cost-effective and efficient manner. This requires an integrated approach involving all aspects of the enterprise and all the members of the enterprise. The leadership teams in continuously successful enterprises like Toyota understand a principle of physics that seems to elude many: When a ship sinks, the entire ship sinks! There is no place in today’s environment for protectionism and the rice-bowl-defending mentality. We need to establish enterprises with collaborative and supportive infrastructures focused on achieving the mission, vision, and goals of our enterprise.

Over the past 20 years we have worked with many successful companies and government agencies that have become agile and flexible in their operations with a commitment to their customers leading them to prosper and thrive as they satisfy and delight their customers. They have accomplished this by taking a long-term, enterprise view of their business and then tailoring and innovating the best practices and methodologies for achieving their goals. Their successes are easily measured by their profits, increased value, increased stakeholder satisfaction, increased market share, increased employee satisfaction, and winning awards such as Malcolm Baldrige National Quality Award. We call this Enterprise Excellence.

ENTERPRISE EXCELLENCE

An *enterprise* is defined as a systematic purposeful activity. This applies to business, industry, academic, government, and military organizations. Every new enterprise starts with a vision. This vision is translated into an enterprise-level mission statement and set of goals. In order to achieve the goals, satisfy the mission requirements, and achieve the vision, eight critical functions need to be performed. All of these functions need to be performed within the enterprise, no matter how large or small, whether business, industry, or government:

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1. Strategic planning
2. Market and customer research and communication
3. Research and technology development
4. Product, service, and process design
5. Product and service commercialization
6. Postlaunch production
7. Product and service support
8. Measurement, analysis, and knowledge management

The specific organization structure and the attendant roles and responsibilities will need to be guided by your environment, key working relationships, strategic challenges, advantages, industry, and culture. But in all cases, each of the eight functions needs to be accounted for and the appropriate infrastructure, policies, guidelines, and processes established.

Strategic Planning

An enterprise starts with an idea, a need, or an opportunity. This is formulated in a vision and mission. These need to be clear and concise, providing unequivocal guidance for the direction of the enterprise—what are you trying to accomplish? Success will depend on every individual in the organization knowing, understanding, and fully embracing the purpose and direction of the enterprise. Successfully achieving the vision and mission requires members of the leadership team to develop and deploy their enterprise values, vision, mission, goals, and objectives in the enterprise strategic plan. This plan documents the direction for the organization (i.e., what customer base it will serve, what technology it will pursue, what types of products and services it will provide, how it will measure success). It also provides the foundation for the structure of the enterprise as well as the roles and responsibilities of each function and the workforce within each work center.

Regular reviews of the strategic plan are required to adjust to the changing circumstances. Requirements are needed within the strategic plan for regular, periodic monitoring, measuring, evaluating, and reporting of progress. At a minimum, the plan needs to be reviewed, revised, and published annually. Conformance to the plan needs to be deployed to all organizations and all employee performance goals and objectives.

Market and Customer Research and Communication

Market and customer research and communication are critical to collect the data necessary to develop the strategies for strategic planning. This is the function that identifies which opportunities within the customer groups and market segments to pursue. This is the function that develops the voice of the customer (VOC) data that identifies customers' requirements and expectations and

measures their satisfaction. The information developed here provides the basis for the fact-based decisions about what technology to pursue and what products and services to offer. How the enterprise communicates with the customers and the marketplace, and the nature of that communication, will influence and even shape customer expectations and requirements.

Research and Technology Development

When we rush to the marketplace with immature technology or with a product or service that is the result of poor technology transfer, the resulting problems with production and support are costly in scrap, rework, repair, customer considerations, warranty repairs, and lost customer and marketplace confidence. Therefore, sustainable growth requires development of mature technologies transferred effectively and efficiently to the mix of products and services produced by the enterprise.

Product, Service, and Process Design

After the enterprise strategies are established, it is necessary to define the offerings for the customer and design the total customer experience. This is accomplished by determining the customer requirements and expectations, defining what our differentiating characteristics will be, and designing the customer-performance model.

Product and Service Commercialization

Our goal is to develop products, services, and processes that are robust to sources of destabilizing variation. This function is a systems engineering and integration approach to efficiently realizing the customer performance model in the product, service, and process delivered to the customer. This function includes selection of materials, design of production processes, make-buy decisions, and variability reduction activities. Design for Lean Six Sigma is the methodology that effectively accomplishes this goal.

Postlaunch Production

Our purpose is to cost-effectively produce the products and services, on schedule, that meet or exceed the expectations of the customer, as defined by the customer. This includes all in-house activities that add value to the materials to produce the products and services offered to the customers. Postlaunch production includes all activities to produce the products and services after initial development.

Product and Service Support

After the product or service is delivered to a customer, there are continued opportunities to serve the customer: troubleshooting, repair, replacement, data

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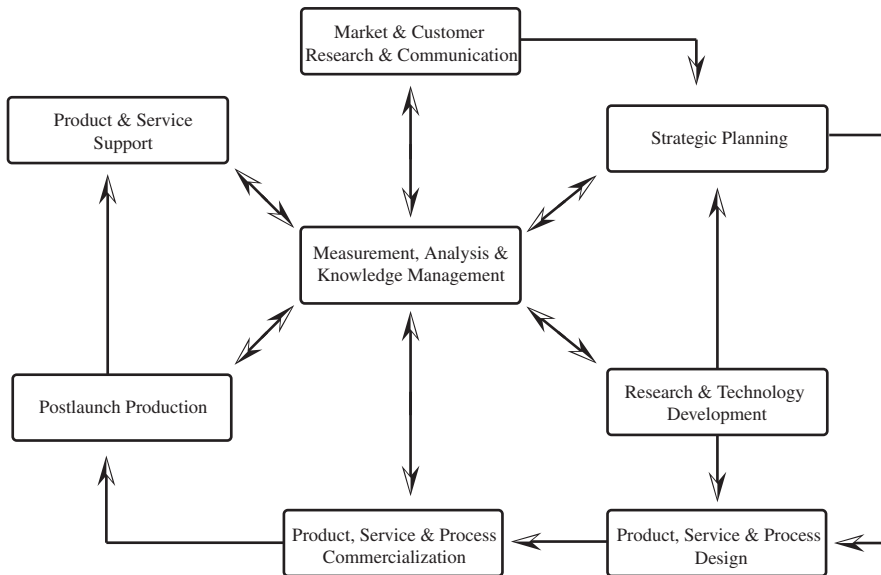


FIGURE 1.1 Enterprise Functions.

collection, and communication activities. These support activities are critical to customer satisfaction and provide an opportunity to collect further information about customer wants and desires. Such follow-up provides a mechanism for communicating information to the customers and thereby provides an opportunity to shape expectations. In the military environment, this function provides a different dynamic. In the military environment, product and service support includes organic and depot maintenance and disposal at the end of the product life.

Measurement, Analysis, and Knowledge Management

The effectiveness of the previous seven functions depends on the quality, reliability, timelines, and availability of data and information. This function is therefore the central nervous system for the enterprise. It provides the policies, guidelines, and requirements for the processes for selecting, collecting, aligning, and integrating data and information for tracking daily operations. It establishes the key enterprise performance metrics and provides for regular periodic performance reviews. This function is the foundation for fact-based decision making within the enterprise.

The relationship of the enterprise functions and the flow of information, products, and services is illustrated in Figure 1.1.

Enterprise Excellence is a holistic approach for establishing an agile, flexible enterprise and managing it to thrive in the twenty-first century. The Enterprise Excellence methodology focuses on optimizing the critical success factors of

quality, cost, schedule, and risk, to achieve your goals. It facilitates the improvement of the operations of the organization and focuses the leadership, management, and technology on the critical systems and processes of the enterprise. The successful deployment of Enterprise Excellence results in an organization with a fact-based decision-making culture. The infrastructure and processes of Enterprise Excellence creates an agile and flexible organization capable of quickly addressing problems, changing requirements, changing markets, changing technology, changing missions, and so on. These traits will lead to reduced costs, reduced cycle time, reduced risk, maximized customer satisfaction, and increased value of the organization.

ENTERPRISE EXCELLENCE MODEL

Each organization operates as an enterprise in that it is a collection of processes focused on producing products and/or services for customers with the goal of producing a profit and increasing its value. Profit and value may be defined as money, capital equipment, real estate, improved efficiency, experience, influence, and so on. This principle applies regardless of the type of enterprise (commercial, industrial, nonprofit, or government), its size, or the technology involved. In all instances, an enterprise is focused on staying healthy and increasing its value to its customers. Customer satisfaction is therefore the key to increasing the value of the enterprise. The goal is to cost-effectively satisfy the customers' requirements and expectations, to increase market share, and to raise value to the stakeholders.

As indicated in the Figure 1.2, Enterprise Excellence begins with establishing a *management system* and a *voice of the customer system* (VOCS). These first two elements of the model ensure the organization is focused on the requirements and expectations of the customer and that it has the infrastructure in place for managing the enterprise to achieve a competitive edge. The management system establishes the infrastructure, processes, and procedures necessary for leading and managing the organization. The VOCS is accomplished through implementation of Design for Lean Six Sigma (DFLSS), which establishes the infrastructure, processes, and procedures for performing research, technology development, and transfer and developing the products, services, and processes necessary for cost-effectively satisfying customer requirements and expectations. Throughout its life cycle, the enterprise it needs to continually monitor, evaluate, and report performance of the enterprise (continuous measurable improvement). This is critical to establishing the desired agility and flexibility to thrive in the twenty-first century.

Enterprise Management System

The management system represents the basic management approach of the enterprise. This basic approach will reflect the culture of the organization and how

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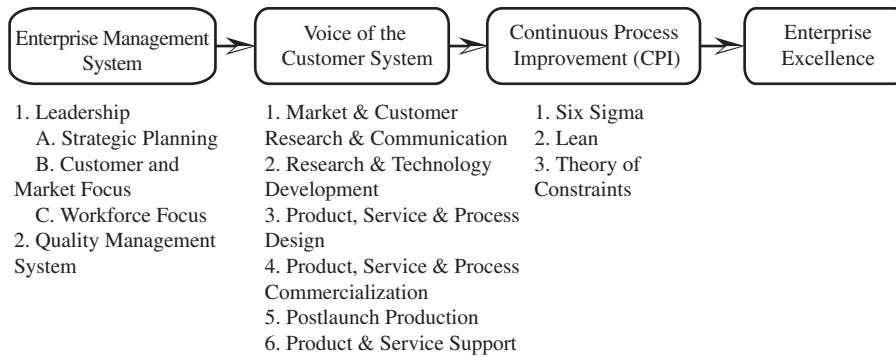


FIGURE 1.2 Enterprise Excellence Model.

the enterprise will be managed. The elements of the management system include *leadership* and the *quality management system*.

The leadership element is where we establish the organizational values, vision, mission, goals, and objectives. We establish the methodology for deploying these throughout the organization and communicate them to the workforce, key suppliers, partners, customers, and other stakeholders. This process provides for a collaborative and supportive deployment of goals and objectives from the executive leadership team throughout the organization.

The quality management system (QMS) provides an organization with a set of processes that ensure a structured, logical approach to the management of the organization. These processes are geared to ensure consistency and improvement of working practices, which in turn should provide products and services that meet customers' requirements. The most commonly used international standard that provides a framework for an effective quality management system is ISO 9001:2000.

While ISO 9001:2000 doesn't define what quality is for a particular product or industry, it does define the requirements for a management system to control processes for quality. The standards represent a consensus on what constitutes good management practices that will enable an organization to reliably deliver products or services that meet the requirements of the customer. By using the procedures and processes like those presented in ISO 9001:2000, organizations will reliably produce goods and services that meet the needs and requirements of their customers.

Baseline QMS requirements are:

- Processes and procedures with controls
- An organizational structure with defined management roles and responsibilities
- Processes communicated throughout organization

- A method for decision making
- Commitment to continuous measurable improvement

Some standardized systems are:

- Voluntary (e.g., ISO 9001:2000)
- Regulatory requirements (e.g., FDA)
- Some support going beyond minimum compliance to Enterprise Excellence

One of the most critical elements of a quality management system is a commitment to continuous process improvement (CPI). There are many standardized quality management systems, such as ISO-9001-2000, QS-9000, ISO-14000, and so forth. All of these provide a good structured approach for establishing and maintaining a basic quality management system.

Voice of the Customer System

VOCS includes the policies and guidelines, infrastructure, and processes that address the requirements and expectations of both internal and external customers: internal customers for developing the processes to design, develop, produce, and deliver the products and services to the external customers; external customers to ensure satisfying their requirements and expectations for the products and services of the enterprise. This is the essence for providing a customer-focused enterprise.

Voice of the customer system refers to a commitment and systems engineering approach for knowing and understanding the full scope of customer requirements and needs, then using this knowledge to cost-effectively satisfy the customers from concept to obsolescence and disposal. The systems engineering approach provides for both the design of the system's components and the integration of those components into a qualified system acceptable to the entire customer set across the life cycle of the system. The key concept underlying the implementation of this process is concurrent engineering. The tools and techniques for execution of each step of the process are the engineering methodologies. This approach is supported by Design for Lean Six Sigma (DFLSS), which consists of a focused process for identifying customer requirements and expectations; establishing robust products, services, and processes; and using integrated product and process development (IPPD) to develop the products, services, and the processes for producing them.

Design for Lean Six Sigma provides a process, discipline, and methodology that supports systems engineering and ensures effectively and efficiently satisfying the requirements and expectations of the entire customer set during the conceptual and preliminary design, detailed design and integration, and production periods of the life cycle. Continuous measureable improvement brings a

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methodology to cost-effectively improve the processes and products during production and the use, refinement, and disposal periods of the life cycle.

There are two processes and sets of tools and techniques in Design for Lean Six Sigma. The first is for the development of new technologies and preparing to transfer them to new products and services. This process is Invent/Innovate-Develop-Optimize-Verify (I²DOV). The second is for the design and development of new products, services, and processes. This is Concept-Design-Optimize-Verify. The two processes are similar, use many of the same tools and concepts, but are focused on different goals. The first is focused on developing new technologies and preparing them for transfer to new products, services, and processes. The second is focused on developing new products, services, or processes.

CONTINUOUS MEASURABLE IMPROVEMENT

Fact-based decision making is centric to Enterprise Excellence. Continuous measurable improvement (CMI) is the methodology for monitoring, measuring, and evaluating our operations to provide the data for fact-based decision making and to continually improve operations in order to achieve our vision. There are two major methodologies in continuous measurable improvement (CMI). One focuses on effectiveness (Six Sigma) by reducing variability by improving quality and creating robust processes. The other (Lean) focuses on efficiency by removing waste. Which approach we pursue when a problem or opportunity is identified depends on its nature and scope. We would always prefer to be effective and then determine how to eliminate waste and become efficient. There are instances when emergent requirements drive us to become efficient first (e.g., schedule or waste issues are overpowering the organization). As illustrated in Figure 1.3 if we pursue effectiveness we must then Lean the process, and if we Lean first we must then evaluate the effectiveness to eliminate variability.

Six Sigma (6σ)

Six Sigma is a disciplined, structured approach for process, product, and service optimization focused on quality improvements, reducing process variability, and

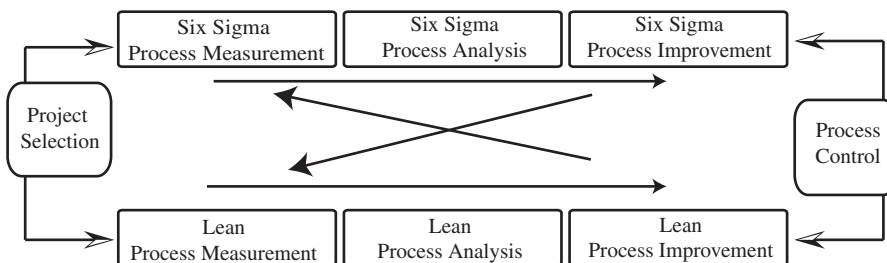


FIGURE 1.3 Continuous Measurable Improvement.

increasing process and product robustness. Additionally, the goal of Six Sigma activities is improving the bottom line of the organization (i.e., improving products, services, and processes to collaboratively support achieving the vision, mission, goals, and objectives of the enterprise).

Six Sigma provides an infrastructure, a well-defined tool set, and a process intended to be used in new product/process development and for improvement projects for existing products and services. In the development of products, services, and processes Six Sigma provides the methodology and tools for achieving the required robustness and *effectiveness* of processes. Once in production, Six Sigma provides a focused approach and well-defined tool set for achieving continuous measurable improvement. If used appropriately, Six Sigma will result in directly improving the bottom line of an organization by improving quality and meeting operating schedules while reducing costs and risks. Six Sigma provides a specific tool set and instructions for applying the tools. The Six Sigma methodology for reducing variability and improving *effectiveness* is referred to as Define-Measure-Analyze-Improve-Control (DMAIC). The Six Sigma methodology is focused on process, product, and service effectiveness improvement and therefore includes tools and techniques unique to variability reduction, but also uses some that are also part of Lean.

Lean

The Lean methodology, sometimes referred to as *Lean enterprise* or *Lean thinking*, represents the manner in which organizations must be managed in a highly competitive environment. This concept embodies a collective set of principles, tools, and application methodologies that enable organizations to remove waste from the system and achieve dramatic competitive advantages in development, cost, quality, and delivery performance. It is a methodology intended to increase the *efficiency* of an organization's operation by eliminating or minimizing waste. Lean provides a systems engineering approach to the efficiency of the enterprise. It is concerned with eliminating waste, streamlining operations, and coordinating activities that will directly affect the bottom line of an organization or company. Integrated in the voice of the customer system, Lean ensures the optimal efficiency in the production of products and services and assists in early detection and correction of problems. The Lean methodology for eliminating waste and improving efficiency is referred to as Define-Measure-Analyze-Lean-Control (DMALC). The overall approach is the same as Six Sigma. It uses some of the same tools and techniques that are part of Six Sigma but has some that are unique to Lean.

The collaborative effect of the enterprise management system, voice of the customer system, and continuous measurable improvement (Six Sigma and Lean) is the clear understanding of the requirements and expectations of the customers (internal and external) and the establishment of an infrastructure, methodology, and comprehensive implementation strategy for ensuring that high-quality products and services are cost-effectively provided. The focus is

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on listening to the customer, understanding what the customer values, and effectively and efficiently delivering customer satisfaction throughout the life cycle of the system, product, and services.

In other words the enterprise management system provides the answer to “what needs to be done and why?” This is collaborative and supportive of the voice of the customer system, which provides the answers to “what, where, and when?” Six Sigma provides the answer to “how do we achieve and maintain the required product and process robustness?” Lean provides the answer to “what is the waste in our system/environment and how do we eliminate it?”

In this way we see the strategies do not conflict, nor are they meant to be in competition with each other, but are collaborative and supportive. They not only provide positive contributions in their own right, but are enhanced and supportive when used together. For this reason, the use of multiple strategies, in a holistic manner, needs to be seriously considered when an organization realizes the need for improvement. However, it is important to remember that whenever more than one of these improvement strategies is adopted, their common characteristics and complementary aspects should be taken into account.

To achieve this balance between *effectiveness* (Six Sigma) and *efficiency* (Lean) it is important not to segregate or departmentalize any of these strategies from the others when deploying them. This would ensure little or no improvement at best, and waste activities that use up precious resources at worst. Therefore, the integrated deployment of these strategies ensures the cultural and organizational changes essential for the success of the enterprise. Existing business processes must be made to be effective and then efficient. This is the road map to process optimization and a direct route to improving the bottom line of any organization.

ACHIEVING ENTERPRISE EXCELLENCE

Once the decision is made to implement Enterprise Excellence the question is, where do we start? In other words, how do we deploy Enterprise Excellence? How do we change the way the enterprise operates and institute a new way of thinking and operating? This is in fact a change in the culture of the enterprise. There are three common deployment strategies: *deployment by pilot study*, *project-by-project deployment*, and *enterprise-wide deployment*.

Deployment by Pilot Study

Many organizations will choose to use the deployment by pilot study strategy. This is a low-risk and low-investment approach. If people are unsure of the consequences of a particular course of action and are cautious and fearful of the consequences of failure, this is the strategy they will select. In this strategy we select a single function within the organization and implement Enterprise Excellence. If it achieves the desired goals, we select other areas to begin “trying”

to implement Enterprise Excellence. This strategy does not foster commitment due to limited involvement of the leadership team and the narrow scope of implementation. Deployment by pilot study will not yield a large return on investment or effect a cultural change. In fact, just the opposite is true. The functions involved with the pilot studies will be viewed with skepticism by the rest of the organization. This will limit success, since all processes within the enterprise are, by their nature, cross-functional and multidisciplinary. Each process has customers and suppliers within and outside of its organization.

Project-by-Project Deployment

If people are confident that a selected course of action is a good idea but still have reservations and concerns about the consequences of failure, this is the strategy they may select. This is the typical strategy used in organizations that implement Six Sigma or Lean. In this strategy, improvement projects are identified, and cross-functional, multidisciplinary teams are developed to address specific problems or opportunities. Typically, the interrelationship of problems and opportunities are ignored in the implementation of this strategy. This strategy frequently results in optimizing one area of the enterprise at the cost of suboptimizing the enterprise. This strategy may show a moderate to high return on investment with moderate risk, but despite a wide scope will result in only a shallow effect on the organization. The cultural change resulting from this method of deployment is slow and uncoordinated.

Enterprise-Wide Deployment

Enterprise-wide deployment requires executive commitment. It begins with the decision to implement a change in the culture of the enterprise through the implementation of new processes and techniques. Deployment by pilot study and project-by-project are limiting strategies of caution testing Enterprise Excellence. A strategy focused on the entire enterprise is required to achieve the full benefits of Enterprise Excellence. This is an enterprise-wide deployment strategy led by the executive leadership team and deployed throughout the entire organization in a structured, planned method. It requires major commitment of resources, yet has a very low risk of failure and is the quickest way to achieve the organizational transformation to Enterprise Excellence. This strategy, through its top-down coordination, results in a broad and deep implementation. This results in a collaborative and sustained cultural transformation. This transformation is facilitated through the creation of cross-functional, multidisciplinary team members working together to improve the effectiveness and efficiency of enterprise processes.

Enterprise Excellence Deployment

Enterprise Excellence deployment begins first with a decision and commitment to deploy Enterprise Excellence. Once that decision has been made, the next

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step is to perform the assessment. An *enterprise senior review group* (ESRG) is established to lead the assessment and to prepare for the development of the Enterprise Excellence deployment plan. This executive leadership team's initial responsibility is to ensure the assessment is a thorough evaluation of the organization infrastructure and performance against the Enterprise Excellence model. This includes review of the organization's management system, voice of the customer system, and continuous measurable improvement infrastructure and implementation. This evaluation is analyzed to define the existing state and compare it with the desired state. The results of the assessment are used to develop a recommended course of action to close the gap and achieve the desired state. The assessment is documented in an assessment report to include findings, conclusions, recommendations, and plan of action and milestones (POA&M).

Enterprise senior review group (ESRG) is the senior leadership team of the enterprise who will lead the deployment of Enterprise Excellence. Initially, the ESRG members will meet three days per month for six months. Thereafter, they will meet at least monthly. The first six sessions will be focused on using the Enterprise Excellence assessment (POA&M) to define specific actions, roles, and responsibilities for implementing the plan. They will also receive training on the Enterprise Excellence methodology, process, and leading the transformation. These early sessions will also be used to (1) refine the enterprise values, vision, goals, and objectives, (2) develop the enterprise value stream, (3) define a portfolio of enterprise improvement projects, (4) identify a group of Lean Six Sigma Black Belt candidates, and (5) identify a resource to provide the requisite Lean Six Sigma Black Belts and continuous measurable improvement subject matter experts (SMEs) development. The initial Black Belt candidates are individuals who will lead the first set of enterprise-level projects identified by the ESRG. These individuals will be the core internal support for the deployment of Enterprise Excellence.

In parallel with the start of development of the Enterprise Excellence senior review group, the initial group of Lean Six Sigma Black Belt candidates will begin their training. Additionally, Champion workshops will be initiated for the senior managers. These workshops will prepare the senior managers to lead the implementation of the Enterprise Excellence strategy. These workshops will provide the senior managers an awareness and appreciation of Enterprise Excellence, its methodology, processes, and tools. It will prepare the managers to sponsor and champion Enterprise Excellence deployment activities. This will include an application skill level for leading Enterprise Excellence implementation. Monthly reviews will be performed by the ESRG to evaluate implementation progress, review and approve improvement projects, and reprioritize actions, as required.

As defined in the assessment report, VOCS activities are prioritized by the enterprise senior review group. This includes defining (1) research and technology development, (2) product, service, and process design, and (3) product and service commercialization processes for the enterprise. Implementation plans are developed and implemented. At this time, customer and employee feedback systems are established or improved, as required.

After the initial wave of Black Belts begin training, and as the Champion workshops are being conducted, Green Belt and additional Black Belt training will begin. The training goals will be established by the enterprise senior review group; however, generally, all supervisory personnel need to be Green Belts. Requirements for Black Belts will depend on the size of the organization and the nature of its business. In addition, the ESRG will have developed a deployment plan that will define requirement for the Master Black Belts. This plan will provide for developing a cadre of Black Belts and Master Black Belts for establishing a self-sufficient infrastructure and strategy.

Depending on the commitment and resources, this strategy will deliver a self-sustaining, organizational transformation within three years. This will be an agile organization capable of quickly addressing problems, changing requirements, changing markets, changing technology, changing missions, and so on. It will be an organization with a culture based on fact-based decision making, and a self-sufficient workforce that is trained to employ the tools and methods of fact-based decision making.

The deployment of Enterprise Excellence enables the organization to optimize the critical success factors of quality, cost, schedule, and risk. It uses a holistic, collaborative approach for managing and improving operations of the organization, and it focuses the leadership, management, and technology on the critical systems and processes of the enterprise. This is accomplished through a focused, collaborative deployment of the three critical elements of Enterprise Excellence: quality management system, voice of the customer system, continuous measurable improvement. The details of the deployment depend on the specific situation of your organization. The assessment points to those areas of immediate concern and prioritizes the actions necessary for success. The appropriate methods, processes, and tools are then selected and the solution is adapted for the need. This focused, collaborative, and holistic approach leads to achieving the competitive edge for business, industry, and government agencies.

KEY POINTS

Enterprise Excellence

An *enterprise* is defined as a systematic purposeful activity. Every new enterprise starts with a vision. This vision is translated into an enterprise-level mission statement and set of goals. To achieve the vision requires eight critical functions:

1. Strategic planning
2. Market and customer research and communication
3. Research and technology development
4. Product, service, and process development
5. Product commercialization

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6. Postlaunch production
7. Product and service support
8. Measurement, analysis, and knowledge management

Strategic Planning

Successfully achieving the vision and mission requires the leadership team members to develop and deploy their enterprise values, vision, mission, goals, and objectives in the enterprise strategic plan. This plan documents the direction for the organization. It provides the foundation for the structure of the enterprise as well as the roles and responsibilities of each function and the workforce within each work center.

Market and Customer Research and Communication

This is the function that develops the voice of the customer (VOC) data that identifies customers' requirements, and expectations and measures their satisfaction. The information developed here provides the basis for the fact-based decisions about what technology to pursue and what products and services to offer. What and how the enterprise communicates with the customers and the marketplace will influence and even shape their expectations and requirements.

Research and Technology Development

Sustainable growth requires development of mature technologies transferred effectively and efficiently to the mix of products and services produced by the enterprise.

Product, Service, and Process Design

Products, services, and processes require knowing and understanding customer requirements and expectations, defining differentiating characteristics, and then designing the products and services.

Product, Service, and Process Commercialization

This function is a systems engineering and integration approach that includes selection of materials, design of production processes, make-buy decisions, and variability reduction activities.

Postlaunch Production

Postlaunch production includes all activities to produce the products and services after initial development.

Product and Service Support

After the product or service is delivered to a customer, there are continued opportunities to serve the customer. These support activities are critical to customer satisfaction and provide an opportunity to collect further information about customer wants and desires.

Measurement, Analysis, and Knowledge Management

The effectiveness of the previous seven functions depends on the quality, reliability, timelines, and availability of data and information. This function provides the policies, guidelines, and requirements for the processes for selecting, collecting, aligning, and integrating data and information for tracking daily operations. It establishes the key enterprise performance metrics, and provides for regular periodic performance reviews.

Enterprise Excellence Model

Enterprise Excellence begins with establishing a management system and a voice of the customer system (VOCS). These first two elements ensure the organization is focused on the requirements and expectations of the customer and has the infrastructure in place for managing the enterprise to achieve a competitive edge. The continuous measurable improvement element of Enterprise Excellence is critical to establishing the desired agility and flexibility to thrive in the twenty-first century.

Enterprise Management System

The management system represents the basic management approach of the enterprise. This basic approach reflects the culture of the organization and how the enterprise is managed. The elements of the management system include leadership and the quality management system.

Voice of the Customer System

VOCS includes the policies and guidelines, infrastructure, and processes that address the requirements and expectations of both internal and external customers. Voice of the customer system refers to a commitment and systems engineering approach for knowing and understanding the full scope of customer requirements and needs, then using this knowledge to cost-effectively satisfy the customers from concept to obsolescence and disposal.

There are two processes and sets of tools and techniques in Design for Lean Six Sigma. The first is for the development of new technologies and preparing to transfer them to new products and services. This process is Invent/Innovate-Develop-Optimize-Verify (I²DOV). The second is for the design and development of new products, services, and processes. This is Concept-Design-Optimize-Verify.

Continuous Measurable Improvement

Fact-based decision making is centric to Enterprise Excellence. Continuous measurable improvement (CMI) is the methodology for monitoring, measuring, and evaluating our operations to provide the data for fact-based decision making and to continually improve operations in order to achieve our vision. There are two major methodologies in continuous measurable improvement (CMI). One

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focuses on effectiveness (Six Sigma) by reducing variability by improving quality and creating robust processes. The other (Lean) focuses on efficiency by removing waste.

Six Sigma (6 σ)

Six Sigma is a disciplined, structured approach for process, product, and service optimization focused on quality improvements, reducing process variability, and increasing process and product robustness.

Lean

The Lean methodology represents the manner in which organizations must be managed in a highly competitive environment. This concept embodies a collective set of principles, tools, and application methodologies that enable organizations to remove waste from the system and achieve dramatic competitive advantages in development, cost, quality, and delivery performance.

Achieving Enterprise Excellence

Enterprise Excellence Deployment

Enterprise Excellence deployment begins first with a decision and commitment to deploy Enterprise Excellence. Once that decision has been made, the next step is to perform the assessment. An enterprise senior review group (ESRG) is established to lead the assessment and to prepare for the development of the Enterprise Excellence deployment plan. This executive leadership team's initial responsibility is to ensure the assessment is a thorough evaluation of the organization infrastructure and performance against the Enterprise Excellence model. This includes review of the organization's management system, voice of the customer system, and continuous measurable improvement infrastructure and implementation. The results of the assessment are used to develop a recommended course of action to close the gap and achieve the desired state.

Enterprise senior review group (ESRG) is the senior leadership team of the enterprise who will lead the deployment of Enterprise Excellence. The ESRG will (1) refine the enterprise values, vision, goals, and objectives, (2) develop the enterprise value stream, (3) define a portfolio of enterprise improvement projects, (4) identify a group of Lean Six Sigma Black Belt candidates, and (5) identify a resource to provide the requisite Lean Six Sigma Black Belts and continuous measurable improvement subject matter experts (SMEs) development. The initial Black Belt candidates are individuals who will lead the first set of enterprise-level projects identified by the ESRG. These individuals will be the core internal support for the deployment of Enterprise Excellence.

Monthly reviews will be performed by the ESRG to evaluate implementation progress, review, and approve improvement projects, and reprioritize actions, as required.

As defined in the assessment report VOCS activities are prioritized by the enterprise senior review group. This includes defining (1) research and technology development, (2) product, service, and process design, and (3) product and service commercialization processes for the enterprise. Implementation plans are developed and implemented. At this time, customer and employee feedback systems are established or improved, as required.

After the initial wave of Black Belts begin training and as the Champion workshops are conducted, Green Belt and additional Black Belt training will begin. The training goals will be established by the enterprise senior review group; however, generally, all supervisory personnel need to be Green Belts.

Depending on the commitment and resources, this strategy will deliver a self-sustaining, organizational transformation within three years.

Deployment of Enterprise Excellence enables the organization to optimize the critical success factors of quality, cost, schedule, and risk. It uses a holistic, collaborative approach for managing and improving operations of the organization and focuses the leadership, management, and technology on the critical systems and processes of the enterprise. This is accomplished through a focused, collaborative deployment of the three critical elements of Enterprise Excellence: quality management system, voice of the customer system, continuous measurable improvement. The details of the deployment depend on the specific situation of your organization.