

Alignment of Baldrige with Six Sigma, Lean Thinking, and Balanced Scorecard

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INTRODUCTION

Baldrige? Six Sigma? Lean? Balanced Scorecard? We don't have time for all of these initiatives! Let's just pick one and go with it!" How many times have you heard (or perhaps even said) something similar to this? The statement suggests the initiatives are equivalent. They are not. As has been discussed earlier in this book, the Baldrige Criteria for Performance Excellence represent a comprehensive set of processes that organizations should have in place in order to optimize performance. Six Sigma, Lean, Balanced Scorecard, and other initiatives represent some tools, albeit powerful tools, that organizations can use to enhance performance

The use of these tools in isolation, without regard to the needs of the entire management system, will not produce optimum benefits or optimum performance for the organization. Many times when the concept of using the Malcolm Baldrige Criteria for Performance Excellence is discussed, Six Sigma or Lean Thinking are brought up as alternative management systems. Many articles and books tout Six Sigma, Balanced Scorecard, or Lean Thinking as the most effective management system in the history of business management. Those opinions are not supported by data. Six Sigma tools, properly implemented, do produce great results, but the tool does not cover all of the elements needed to optimize organizational performance. Six Sigma, Lean, the Balanced Scorecard and other improvement methodologies can best be viewed as tools that help an organization drive toward performance excellence; however, each can become even more valuable if they are used together within the context of a Baldrige-based integrated culture of performance excellence. The use of these tools as part of an integrated approach to maximizing performance, which Baldrige represents, is the best way to drive toward

better results. One is not a substitute for the other – they align well with each other and mutually help drive toward improved business results

Baldrige Overview

The Malcolm Baldrige Criteria for Performance Excellence have the over-arching goal of strengthening U.S. competitiveness in an increasingly global and competitive marketplace. The Baldrige Criteria focus on helping organizations use a focused and systematic approach to performance management that results in:

- Delivery of ever-improving value to customers, contributing to marketplace success
- Improvement of overall organizational effectiveness and capabilities
- Organizational and personal learning

The Criteria are based on a set of Core Values and Concepts (Figure 1) that have been found to be integral beliefs and behaviors in high-performing organizations.

Summary of Baldrige Core Values and Concepts	
Visionary Leadership	Managing for Innovation
Customer-Driven Excellence	Management by Fact
Organizational and Personal Learning	Social Responsibility
Valuing Employees and Partners	Focus on Results and Creating Value
Agility	Systems Perspective
Focus on the Future	

Figure 1 Baldrige Core Values and concepts.

These Core Values and Concepts are the underpinnings of the systematic approach and deployment methods used to drive toward improved business results within organizations using the Baldrige Criteria as their management system. (See pages 27-35 for a complete description of Core Values and Concepts.)

The Baldrige Criteria helps an organization ensure a systematic approach to improvement by developing approach and deployment methodologies for Categories 1-6, and looking for how these approach and deployment methods are linked to improved business results. The Baldrige Criteria are nonprescriptive – they don't tell an organization how to do something, they tell what it should be doing, then leave it to the organization to determine the processes that best fit the organization, its culture, and goals.

Some managers see the Baldrige Criteria only as an award process; however, in reality, most organizations that use the Baldrige Criteria never apply for an award at the national or state level. Thousands of organizations use the Baldrige Criteria as a management model or assessment tool to gauge the maturity and effectiveness of their own management system. The Criteria, available in Business, Education, and Health Care versions, are very flexible. This is demonstrated by the diversity of organizations that have used the Criteria to move to performance excellence. These include a high-school classroom, churches, internal suppliers, nonprofit agencies, and others who have tailored the model to their particular application.

Six Sigma Overview

Six Sigma is an extremely effective tool for systematically attacking the highest priority production and support/functional problems within an organization. A goal of Six Sigma is to reduce defects variation within a work process. It is not, however, the best tool to apply to every problem. Six Sigma requires a significant investment in up-front training, time and people to carry out the projects, and leadership commitment to project reviews. Some problems may not require Six Sigma's highly intensive methodology. Effective leaders separate the problems that deserve a Six Sigma approach from those requiring a different methodology.

General Electric has been recognized as a leading example of a corporation that has used Six Sigma effectively. Several of the key reasons that Six Sigma has been so successful at GE have nothing to do with the Six Sigma process, but are the "enablers" that have driven that success. Several of those enablers include:

- Consistent leadership that drives the organization to quantifiable results
- A culture that is relentless in driving toward continuous improvement
- Effectiveness in committing the resources that increase the chances of a successful project outcome.

Baldrige and Six Sigma Alignment

An example of the Six Sigma Define-Measure-Analyze-Improve-Control (DMAIC) problem-solving process is provided in Figure 2. It is easy to see how this systematic improvement process can help an organization meet some of the requirements of the Baldrige Criteria in Category 6, Process Management, for improving "...value creation processes [Item 6.1] and certain support processes [Item 6.2] to achieve better performance, to reduce variability, to improve products and services, and to keep the processes current with business needs and direction." In addition, Six Sigma encourages a focus on meeting customer requirements [Baldrige Category 3], a leadership-driven initiative [Baldrige Category 1], alignment of improvement projects to the organization's strategy [Baldrige Item 2.2a(1)], effective development and training of human resources [Baldrige Item 5.2], and data-driven decision making [Baldrige Category 4].

Six Sigma can be used to drive deep into root causes to solve the organization's highest impact problems, consistent with the requirements of Baldrige Category 6, Process Management. Effective organizational alignment with the Baldrige Criteria can help focus the positive impact of Six Sigma improvement initiatives.

Six Sigma DMAIC Problem Solving Process			
Phase	Step	Primary Activities	Primary Output
Define	1. Establish the focus	Review initial project charter	Project objective
		Form the team	
		Identify and describe the performance gap	
		Verify the performance with data	
		Complete charter	
Measure	2. Examine the current situation	View the process in detail	Strategies and strategy measures
		Describe the current situation in detail with data	
		Develop strategies	
Analyze	3. Analyze the causes	Brainstorm and prioritize root causes	Root causes
		Use data to verify the causes	
		Select root causes to address	
Improve	4. Act on the causes	Brainstorm possible actions	Actions
		Select actions to take	
		Develop action plans	
		Implement actions on a small scale	
	5. Study the results	Study the results and modify action plans	Revised action plans
Control	6. Standardize the changes	Implement actions on a large scale	Control plan
		Standardize successful actions	
		Develop a process management plan	
	7. Draw conclusions	Identify benefits, difficulties, and lessons learned	Project summary
		Discuss future plans	

Figure 2 Six Sigma DMAIC Problem Solving Process.
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Baldrige as an Aid to Six Sigma Project Selection

A key concern with the Six Sigma process is how to choose the appropriate projects on which to spend valuable time and resources. An article by **Ronald D. Snee** in the March, 2001 edition of *Quality Progress* (published by ASQ, Milwaukee, WI) was titled “Dealing With the Achilles’ Heel of Six Sigma Initiatives: Project Selection is Key to Success.” When Six Sigma is approached from a Baldrige management system perspective, areas of focus have already been identified in a variety of ways:

1. Completion of an Organizational Profile that walks the organization through an overview of the organizational environment in which it operates, key relationships with customer groups and suppliers and partners, the competitive environment in which it operates, the strategic challenges it faces, and its performance management system. This Organization Profile is the first step in moving forward with a Baldrige assessment; however, its greatest value may lie in its ability to move the entire organization to a common understanding of its culture, its customers, its strategic challenges and opportunities. Key

Business Factors naturally “fall out” of the Organizational Profile, providing a prioritization capability that aligns Six Sigma efforts around the highest priorities of the organization.

2. As the organization becomes more mature and assesses its management systems against the Baldrige Criteria, it is able to identify and address key strengths and opportunities for Improvement that relate directly to its key success factors. The organization may decide to participate in a state- or national-level Baldrige assessment or develop a Baldrige-based in-house assessment program. The more formal state and national Baldrige assessments make use of independent, externally trained examiners to assess the organization. The resulting feedback report identifies the most critical strengths and opportunities for improvement based on the level of development or maturity of the organization.

OVERVIEW OF LEAN THINKING

Lean Thinking (or Lean Manufacturing, or simply Lean) can best be described as the relentless pursuit, identification, and elimination of waste in all business processes. Business processes over time tend to become fat, boated, and inefficient. Steps are added to processes and become ingrained, after which other new steps are added. Too soon, unnecessary process steps become “the way we do things” and the problems become invisible to workers and managers. Without a periodic re-evaluation of each process step’s value, increased bloating and inefficiency is inevitable.

Lean Thinking revolves around developing teams to identify, then reduce waste through strategies such as workplace organization, mistake-proofing, and visual management. In addition, there is a focus on reducing raw material, work in process, and finished-goods inventory through Just-in-Time production (another improvement tool). Lean Thinking is a more intuitive improvement process than Six Sigma, requiring less in-depth training. This allows more extensive deployment of Lean Thinking training to a broader employee base.

Value Stream Mapping

Lean Thinking begins with developing Value Stream Maps that describe and document the “current state” of the most important processes. Steps in these maps are categorized by value of the steps from the viewpoint of the customer: value-added, non-value-added but necessary, and non-value-added and unnecessary. A “future state” map is then developed to show what the process would look like if identified waste were eliminated. Various Lean tools are used to help convert the process to the future state.

Workplace Order, Safety, and Cleanliness

Another tool integrated into Lean Thinking is “5S.” 5S was developed as part of the Toyota Production System. Toyota was the originator of many of the innovative Lean Thinking concepts. 5S stands for the following, translated from the Japanese:

1. Seiri – Sort
2. Seiton – Set in order
3. Seiso – Shine
4. Seiketsu – Standardize
5. Shitsuke – Sustain

A key to 5S workplace order is “a place for everything and everything in its place.” This simple concept ensures that there is a designated area for each tool, each cart, each item used in production. This minimizes time wasted looking for misplaced items, reduces worker frustration and production downtime when materials are not ready for use, and helps drive safety in the workplace by eliminating or minimizing workplace hazards.

Just-in-Time (JIT) Production

Products in a Lean organization are produced to customer demand rather than at capacity of the production line. This is referred to as “takt time,” (*takt* is German for musical meter) in which product is produced to the “drumbeat” of customer demand. JIT production helps minimize machine set-up changes, work-in-process, and finished-goods inventory. In addition, JIT production frequently reduces raw material inventory by setting up JIT raw material delivery by suppliers.

Empowered Teams

A key to the success of Lean initiatives is the involvement of all employees. The involvement of employees who work in the process being improved has been shown to increase employee engagement and improve the effectiveness of decision making. Recognizing that value in the customer's eyes is created in the production of a product or service, many fully deployed Lean initiatives physically move traditionally "front office" functions such as purchasing and engineering to the factory floor to ensure that resources are available to "support the line" at all times.

The use of empowered teams strongly supports the Baldrige Item 5.1 Work Systems area to address of Organization and Management of Work in which the organization is required to describe how work and jobs are organized to promote cooperation, initiative, empowerment and innovation, as well as how work systems capitalize on the diverse ideas and thinking of employees.

Visual Management

Visual management ensures that performance information is available to workers on a timely basis. This visible performance feedback gives empowered workers immediate feedback on performance, allowing them to have input into the worker's/team's ability to meet goals. Visible scorecards posted in work areas are a common visual management method.

Although the concepts of Lean Thinking are most easily understood and applied in manufacturing, Lean can be a useful tool for all processes within an organization. Lean can be used to eliminate waste in administrative processes (for example, reducing time to generate an invoice), human resources (reducing time to fill open positions), and sales (reducing the time of the sales cycle). Lean is one way of implementing the Baldrige requirement of evaluating and improving all management processes in all six Process categories.

Baldrige and Lean Thinking Alignment

Lean Thinking and Baldrige are aligned in multiple Baldrige categories. As with Six Sigma, it is easy to see how Lean Thinking helps address the areas to address in Category 6 - Process Management as an

organization works to improve its "...value creation processes (Item 6.1) and certain support processes (Item 6.2) to achieve better performance, to reduce variability, to improve products and services and to keep the processes current with business needs and direction." Lean Thinking also encourages a focus on identifying value in the eye of the customer, then building and improving those value-creating processes (Baldrige Category 3), ensuring a leadership-driven initiative (Baldrige Category 1), employee involvement in process improvement in a manner that supports employee motivation (Baldrige Item 5.2), and making needed data and information available (Baldrige Item 4.2). Components of Lean Thinking support Baldrige Item 5.3's Work Environment area to address of ensuring and supporting workplace health, safety, security and ergonomics in a proactive manner. In addition, Lean can contribute to increasing employee well-being and satisfaction and motivation (5.3b(1)). As with Six Sigma, effective organizational alignment around the Baldrige Criteria can help drive the success of Lean Thinking improvement initiatives.

Overview of Balanced Scorecard

Today's Balanced Scorecard is a tool that derives from the principles in the original Baldrige Criteria of 1988. Namely, that effective leaders take a balanced look at key results measures of an organization rather than rely too much on financial measures, which provide an historical look at organizational performance. Accordingly, the basis for this tool is that business results are integrated – that leaders should not view one measure in isolation without acknowledging the relation to other results. A Balanced Scorecard looks at four "perspectives" of the business:

- Financial: "To succeed financially, how should we appear to our shareholders?"
- Customer: "To achieve our vision, how should we appear to our customers?"
- Internal Business Processes: "To satisfy our shareholders and customers, at what business processes must we excel?"

- Learning and Growth: “To achieve our vision, how will we sustain our ability to change and improve?”

Objectives, measures, targets, and initiatives are developed for each of the identified perspectives.

The scorecard balances leading and lagging performance indicators as Figure 3 indicates. The most lagging indicator is financial. For example, financial results reflect all of the errors, satisfied customers, lost customers, production efficiencies and inefficiencies, waste, employee motivation, morale, and skill (or lack thereof) that exist in the organization.

An unbalanced scorecard (Figure 4) typically looks extensively at financials as the driver of organizational priorities, often to the exclusion of the more predictive indicators such as internal business processes and learning/growth. Relying too much on financial indicators to drive decisions is comparable

to driving an interstate highway by only looking in the rear-view mirror. The scorecard is considered unbalanced as Figure 4 demonstrates.

A properly developed Balanced Scorecard aligns closely with the Results Category of Baldrige (See Figure 5). A well-developed Balanced Scorecard should align with the results expected in Baldrige Category 7 (which are driven by key processes in Baldrige Categories 1-6).

Baldrige and Balanced Scorecard Alignment

The Balanced Scorecard is a tool by which an organization can measure its progress toward strategic and operational activities. The Balanced Scorecard aligns with the six Results categories of Baldrige:

The Balanced Scorecard brings various performance measures together in a manner that allows the organization to recognize and address linkages

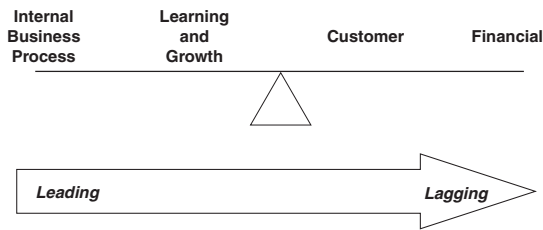


Figure 3 Balanced Scorecard or leading and lagging indicators.

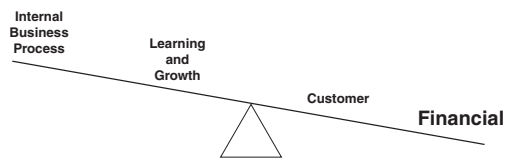


Figure 4 Unbalanced scorecard emphasizing lagging indicators.

Baldrige Results Category	Balanced Scorecard Perspective
7.1 Customer-Focused Outcomes	Customer
7.2 Product and Service Outcomes	Customer-Valued Product and Service Features (part of customer)
7.3 Financial and Market Outcomes	Financial
7.4 Workforce-Focused Outcomes	Learning and Growth
7.5 Process Effectiveness Outcomes	Internal Business Processes
7.6 Leadership Outcomes	Not specifically examined but may be a part of internal business process results

Figure 5 Baldrige-balanced scorecard alignment.



Figure 6 Balanced Scorecard driver relationships.

between various scorecard results perspectives. The Balanced Scorecard recognizes the driver relationships (Figure 6) between the four scorecard perspectives, enabling the organization to focus efforts on those improvements that drive toward financial results that are the ultimate measure of success in the eyes of stockholders and Wall Street.

Alignment of Baldrige, Lean, Six Sigma, and Balanced Scorecard Factors

The success of performance enhancing tools such as Lean, Six Sigma, and the Balanced Scorecard can be enhanced by a “Culture of Excellence” that is characterized by the Malcolm Baldrige Criteria for Performance Excellence. An integrated Baldrige management system is one of the best predictors of a

successful Six Sigma initiative. (See Figure 7) The alignment of Baldrige, Six Sigma, Lean Thinking, and Balanced Scorecards is demonstrated in Figure 8. Note the systematic method by which the Baldrige-based culture of excellence is established, waste is eliminated from processes through Lean Thinking, processes are moved toward perfection using Six Sigma, and progress is measured using a Balanced Scorecard to assess results. The Baldrige criteria require waste reduction, process improvement, and results that are aligned with business strategies and goals. Six Sigma, Lean Thinking, and Balanced Scorecard tools demonstrate how some organizations have chosen to carry out these requirements. The goal of this effectively aligned process is to drive beyond incremental improvement to breakthrough improvement—and breakthrough improvement is where significant competitive advantage is gained.

Management Challenges	Six Sigma Solution	Baldrige Criteria Values and Requirements
Lack of linkage and alignment throughout the organization	Linkage and alignment of Six Sigma initiative to the business's "bottom line"	Baldrige Core Value: Focus on Results and Creating Value Baldrige Alignment: Categories 1–6 These "Approach and Deployment" categories must align with Category 7, Results. Approach and Deployment processes that don't drive toward improved business results contribute very little value to the organization. Baldrige Category 7, the Baldrige "Results" categories are a balanced set of measures, including Customer-Focused, Product and Service, Financial and Market, Workforce-Focused, and Process Effectiveness, and Leadership and Social Responsibility results.
Senior leadership delegation of leadership of TQM initiative to Quality or other department	Senior leadership responsibility for success of the Six Sigma initiative	Baldrige Core Value: Visionary Leadership Baldrige Alignment: Item 1.1a(3) requires leaders to create an environment for organizational performance improvement, innovation, organizational agility, and organizational and employee learning. Item 4.1b(2) requires leaders to translate organizational review findings into priorities for improvement and opportunities for innovation
An unclear concept, direction or focus	A leadership-driven, consistent, simple message	Baldrige Alignment: Item 1.1a(1) requires top leaders to set and deploy organizational values, directions, and expectations.
An unclear goal	Strong focus on ambitious, nonambiguous goals	Baldrige Core Value: Focus on Results and Creating Value Baldrige Alignment: Item 2.1b requires the identification of key strategic objectives and timetables for accomplishing them. These objectives should address the key challenges and advantages faced by the organization. Items 6.1 and 6.2 require the improvement of processes and core competencies that deliver value to customers, including the focus on customer/market requirements and the use of key performance measures/indicators to control and improve performance.
One initiative deployed at the expense of others "All eggs in one improvement basket"	A set of "tools" to address problems systematically. Integrates well with other programs such as Baldrige and Lean	Baldrige Concept: Baldrige is nonprescriptive. It insists that an organization develop improvement methodologies based on its particular business requirements and current circumstances. However, the Criteria note that tools such as Lean and Six Sigma are good ways to enhance performance, reduce or eliminate error and waste, and improve cost efficiency.
Different organizational "silos" with different improvement initiatives	Cross-functional process focus—integration across the organization	Baldrige Core Value: Systems Perspective Baldrige Concept: The Baldrige Criteria focus on the integrated business system, aligned with strategic objectives and related action plans, not functional "silos," in a way that demands alignment throughout the organization and ensures links with demonstrated business results. Baldrige requires alignment and integration among leadership, vision, strategy, action plans, workforce engagement, customer focus, and core competencies, and key work processes (Categories 1–6). These processes produce improved results (Category 7).
Incremental versus breakthrough change	Incremental and breakthrough change	Baldrige Concept: Baldrige-aligned companies continuously compare their results to best practices, both inside and outside an organization's industry. This helps them understand world-class performance to drive to incremental and breakthrough process improvement. Breakthrough change (innovation) is required in all Baldrige process Items and through the scoring guidelines to achieve the upper levels of performance recognition.
Training as an end in itself	Systematic training aligned with business-critical processes	Baldrige Core Values: Organizational and Personal Learning; Valuing Employees and Partners Baldrige Alignment: Item 5.2 focuses on using workforce and leader development to help achieve success with core competencies, action plans, and strategic objectives, helping to ensure that the organization aligns its education and delivery methods to support key business requirements.
Quality as a product or service characteristic only	Improvement of all business processes	Baldrige Core Values: Customer-Driven Excellence, Organizational and Personal Learning and Systems Perspective Baldrige Alignment: Baldrige Category 6 Process Management (6.1 Work Systems Design and 6.2 Work Process Management and Improvement). The Baldrige Criteria go beyond reducing defects and errors, meeting specifications, and reducing complaints. They focus on continuous improvement of all processes throughout the entire organization and ensuring that all parts contribute value to customers.

Figure 7 Alignment of Baldrige, Lean, Six Sigma, and Balanced Scorecard.

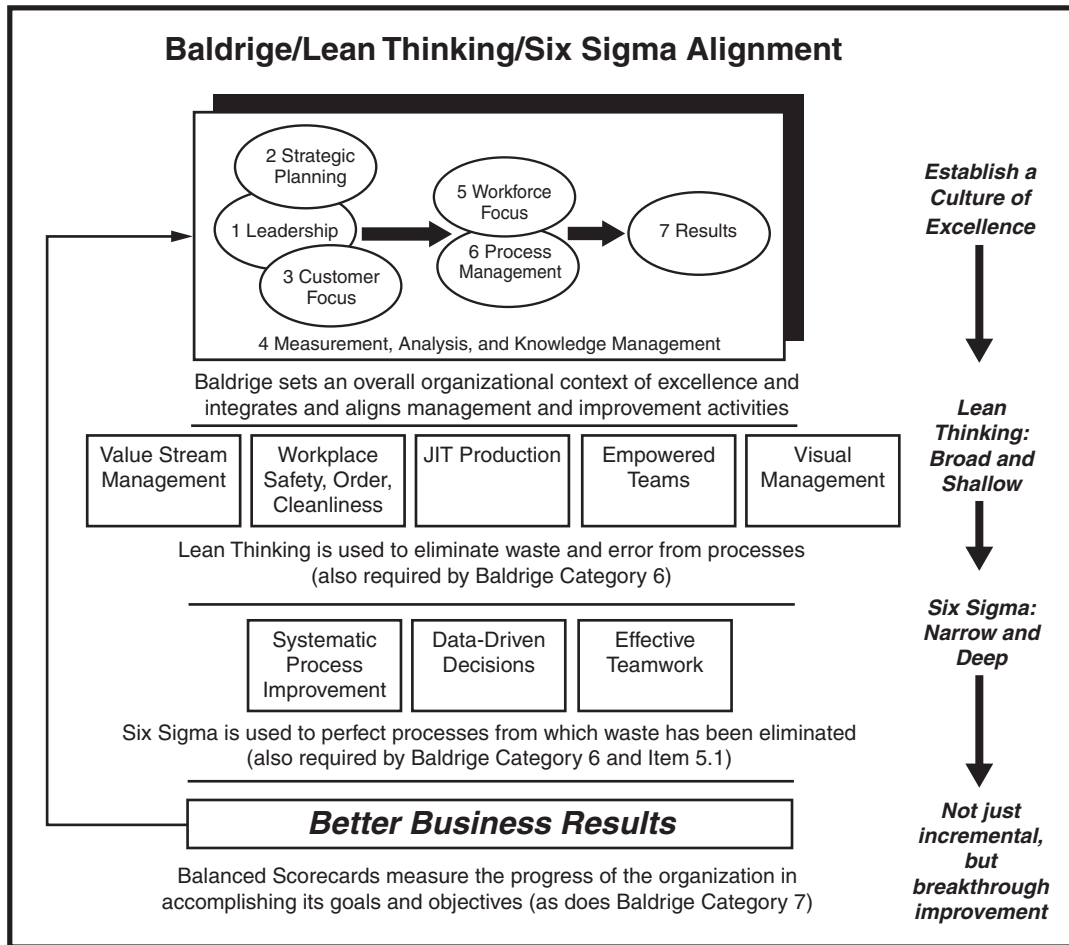


Figure 8 Baldrige, Lean, Six Sigma, and Balanced Scorecard.

Effective alignment of the organization through use of the Baldrige Criteria for Performance Excellence can help jump-start, strengthen, and sustain Lean and Six Sigma initiatives by formalizing leadership commitment, ensuring appropriate resource availability based on the importance of a project to the organiza-

tion, and providing an aligned management system that focuses the organization's efforts on the right improvement projects. Baldrige is a management system that focuses and aligns performance excellence activities. Six Sigma is a tool that focuses performance improvement activities.

