Comprehensive Business Process Management at Siemens: Implementing Business Process Excellence

Bartosz Woliński and Saimir Bala

Abstract

(a) **Situation faced**: Siemens is a complex organization with offices worldwide. Through many years of development, it grew into a set of businesses, each with a substantial degree of autonomy, supported by central departments. This autonomy gives the departments the flexibility needed to achieve customer intimacy, which requires different process flows in different businesses. When the global initiative concerning the implementation of standard business process management was introduced and enacted, businesses were bundled into four sectors. Every sector in the Siemens organization, including that in Poland, was managing its processes according to the local business specifics and needs, which made the comprehensive process management approach challenging. The processes were disconnected and stored in multiple conventions. Corporate initiatives that were intended to address the effectiveness and efficiency of business processes were not supported.

(b) **Action taken**: Siemens strengthened its process-wise approach and worldwide process standardization by implementing a formalized process policy. As a first step, the Business Process Excellence (BPE) regulation (also referred to as BPE policy) was introduced. It formulated the Siemens Processes for Excellence (SIPEX) process standards, which replaced the previous processes base, referred to as Reference Process House (RPH). At the same time, process roles (sponsor, owner, and manager) and corporate

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tools with which to visualize the processes, such as ARIS, were introduced. In the Polish organization, the program was formulated as a vehicle with which to implement the process organization. The goal of the initiative, which was referred to internally as "Streamlining business processes," included chief financial officers (CFOs) as process sponsors and the head of the business process management team as the program manager.

(c) **Results achieved**: At present, on the corporate level Business Excellence is a core element of Siemens—Vision 2020. It is embedded into the Corporate Technology structure, which enables it be the part of innovative products and management standards. It is also a key lever that empowers the company's lasting business success and strengthens its competitiveness in the market.

(d) **Lessons learned**: From the implementation of the program we learned four primary lessons:
- Complexity in many dimensions (number of processes, number of roles, and number of formal documents and circulars) is not supportive of effective process management.
- Having a strong, dedicated sponsor is one of the most important keys to success.
- Not everyone in the organization will appreciate the effort at first, but they will if an attempt is made to understand their businesses and support their efforts.
- Be flexible: without putting one's best effort into implementing the corporate recommendations and without alignment with the business, no appreciation or cooperation should be expected.

1 Introduction

Siemens is a global powerhouse that focuses on the areas of electrification, automation and digitization. With a presence in 190 countries, roughly 413,000 employees working at 1640 locations around the globe and 176 R&D facilities, it is one of the world's largest producers of energy-efficient and resource-saving technologies. Its solutions span along the electrification value chain, from power generation, transmission and distribution to smart-grid solutions and the efficient application of electrical energy, and to the areas of medical imaging and laboratory diagnostics. Numerous goals, such as those related to Power and Gas, Wind Power, Power Generation, Energy Management, Building Technologies, Mobility, Digital Factory, Process Industries and Drives and Financial Services are pursued by the company.

Such a complex structure could easily result in the misalignment of knowledge about the overall business process and consequent difficulties in managing the department-specific processes. Departments were allowed a certain degree of freedom in pursuing their goals without centralized control. This approach reduced

inter-departmental coordination and created differing views and specializations of the overall meta-process on the company level. As a result, the various entities had differing levels of awareness of their processes, ranging from "islands" that already used business process management (BPM) in a mature way, to areas that were completely process-unaware and behaved only according to short-term goals.

The company's top management made a first step toward increasing the synergy among the units by focusing on improving three areas: (1) the effectiveness of structures and processes in the organization itself, (2) the change management culture and proactivity, and (3) collaboration among the businesses using best practices on sharing and innovation, process transparency (i.e., processes that are well defined, well communicated, and measured), and BPM competencies that are centralized, not scattered throughout the company.

The implementation of such strategic alignment comes with a number of practical challenges, one of which is making employees aware of the process in which they are involved and aware that this process belongs to a comprehensive meta-process in the company. This challenge triggered the need for a BPM initiative on an organizational level, which was conducted through workshops that educated the employees about BPM.

This paper describes a case in which a global BPM policy was applied throughout a large company. Section 2 explains the problem setting and points out the problems before the BPM initiative was enacted. Section 3 describes the action taken, the practical challenges, and the methods used to implement the BPM policy. Section 4 describes the results achieved from the policy, and Sect. 5 concludes with the lessons learned from the case.

2 Situation Faced

At Siemens Poland, as well as in the global Siemens organization, the number of divisions changed from four sectors (energy, industry, infrastructure and cities, and healthcare) to the nine current divisions: Power and Gas, Wind Power, Power Generation, Energy Management, Building Technologies, Mobility, Process Industries and Drives, Digital Factory and Financial Services). This change decentralized expertise and created misalignment in how the departments pursued their goals. In order to address this change, Siemens introduced a global BPM policy for all of its affiliated companies to follow. The goal of the new BPM policy was to increase effectiveness and efficiency across all of the company's business processes while standardizing them and aligning them with its goals. From a practical point of view, this effort required that the processes be defined and their performance measured and improved incrementally. Another aspect of the effort was that the reworked processes had to draw from the company's previous performance results and strategic goals in order to minimize resource leaks and performance issues. Adoption of a centralized framework addresses these issues by facilitating the improvement and alignment of the processes.

Prior to the introduction of the centralized BPM policy, the company was divided between two levels of BPM awareness: (1) sectors that already used BPM and were fully aware of the overall business process, and (2) sectors that were BPM unaware. The unaware sectors used sets of tools to handle their tasks that differed from those of the BPM-aware sectors, including non-standardized business process schemata and other graphic representations of workflows. In contrast, the process-aware sectors used process modeling tools like ARIS and automatic support for executing their processes.

In order to manage the processes of its complex organizational structure, the company used the so-called Reference Process House (RPH) process corporate framework (Fig. 1). RPH provides a high-level picture of how the company should organize its processes and enables the company to configure its business processes, including product, system, project, and service activities. RPH consists of three main kinds of processes: management processes, business processes, and support processes. The management processes control the goals and the quality of the core processes defined in the business processes layer, so the core processes must adhere to specified standards and requirements defined by the management processes. The business processes, which are the core processes of the company, typically aim at producing a concrete product. These core processes were divided

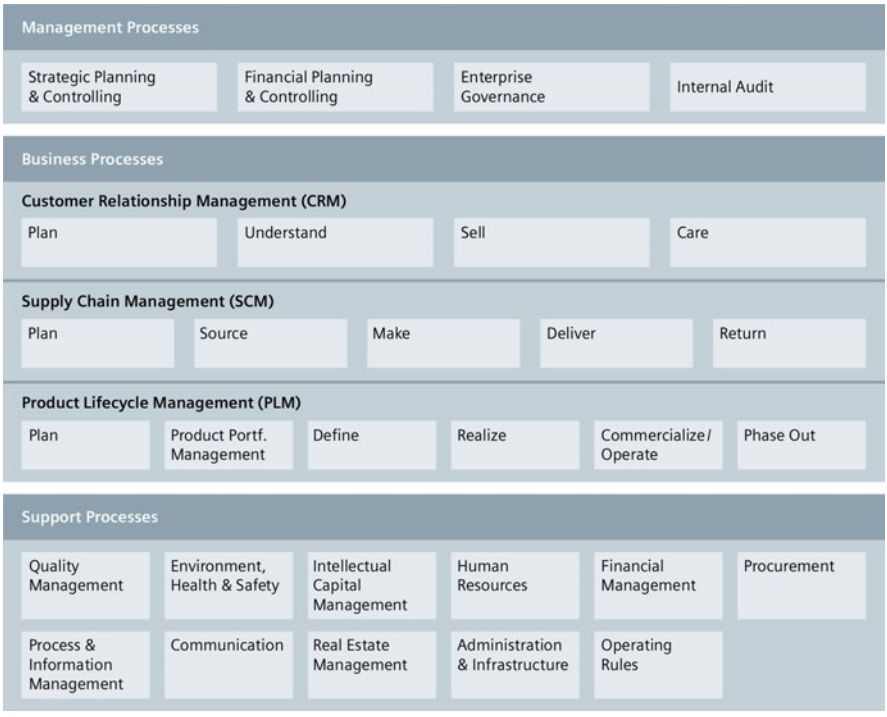

Fig. 1 Siemens' reference process house

into three core processes: customer relationship management (CRM), supply chain management (SCM), and product life-cycle management (PLM). The support processes support the execution of the core processes by providing additional input or managing the resources the core processes need for successful execution.

Although RPH worked in some sectors, it was not sufficiently useful in the context of Siemens, as RPH provided only a high-level picture of how the overall process should look and how the processes should be named. In such a huge and dispersed organization, the role of RPH was only to provide a generic guideline, leaving out many important aspects of implementation. As a result, every sector was managing its processes according to the local business's specifications and needs, which made the comprehensive process management approach challenging. In addition, the processes were stored in various conventions and were disconnected, and RPH did not support the BPM initiative on addressing efficiency and effectiveness issues. As a consequence, employees were still using various conventions to communicate their processes, and the company was characterized by process-aware "islands" that were surrounded by organizational structures that had no vision of the processes in which they were involved.

Consider, for example, two core processes, *sales* and *process execution*. The *sales* process is in close contact with the customer, and its focus is on delivering in the most effective and efficient way. Process execution, on the other hand, takes care of making the processes execute properly, which requires organizing and managing the resources needed to accomplish the goal. In this case, the *sales* processes was not modeled, and *sales* workers operated in an ad-hoc manner in order to be able to react to changes. At the same time, the *process execution* was already using BPM to manage the complexity of processes and resources. This misalignment in BPM maturity led to obstacles in the interactions between the sales and process execution processes, as there was no way to communicate the results, performance, or bottlenecks of the sales processes in such a way that the execution process could provide support.

Hence, the goal of the BPM initiative was to make the employees aware that they were part of a process; to evaluate and improve the performance of the processes; to improve process transparency, compliance, cooperation; and to identify areas where the processes could be automated.

3 Action Taken

This section explains the goals of the solution and the methodology used. We divide the section into three main parts: First, we observe the requirements of the newly introduced BPM policy. Next, we outline the steps taken toward its implementation at Siemens. Then, as we used best practices that were supported by existing excellence policies at Siemens (i.e., SIPEX), we describe the tools and technologies that were adopted to obtain compliance with the BPM policy.

3.1 Requirements of the BPM Policy

The BPM policy, referred to as BPM@Siemens, was developed from the previous Siemens Process Framework (SPF), which used RPH as a model. However, how SPF could address the efficiency and effectiveness requirements (Rohloff 2009) was not sufficient to the newly defined worldwide BPM requirements. To close this gap, Siemens strengthened the process-wise approach and process standardization for its companies worldwide by implementing a formalized process policy based on three principles:

- Simplification—reducing organizational complexity for process management.
- Usability—improving the structure of available data.
- Transparency—well-defined and well-executed processes.

The policy applies to all Siemens organizational units worldwide and sets a company-wide framework for BPM at Siemens as a minimum standard. This regulation is binding for all of Siemens' units. The policy covers seven general topics:

- Elements and terms of Siemens' BPM.
- BPM organization, roles, and responsibilities.
- Process structure and process cascading.
- Process harmonization and standardization.
- Continuous process improvement.
- Methods and tools.
- Governance via regulations and processes.

The new BPM policy focused on aligning processes on the business, operational, management, and support process levels in order to meet the needs of customers, employees, and suppliers. To create value for customers, employees, and business partners the focus was on:

- Excellent quality.
- Short development cycle (time to market).
- Low non-conformance costs.
- Effective communication.
- Efficient deployment of employees.
- A culture of continuous improvement.

The standardization of processes is an important success factor. An example of a company-wide standardized process and consistency in interactions with customers is PM@Siemens, the implementation of which has led to significant improvements in project execution. The policy's goal was to improve flow through the whole value chain, creating a system of a transparent flow. More specifically, PM@Siemens aimed to:

- Design processes as a system (i.e., processes must be organized and interconnected),
- Use Siemens AG conventions (i.e., processes must be standardized),
- Indicate connections (i.e., processes must be transparent),
- Continuously improve processes (i.e., processes must be iteratively refined).

PM@Siemens was implemented using two timeframes:

- On the corporate level within 12 months of publication.
- In lower-level organizational units (e.g., business units) within 24 months of publication.

These goals were summarized to require that f existing process management systems are changed significantly, the regulations defined (in PM@Siemens) are to be used or the tools used are to be changed to the defined standard. This requirement also imposed significant changes to the existing tool landscape, requiring major upgrades, introduction of a new tool landscape, or adjustment of the functionality in existing tools.

Taking into account business needs and costs, migration to the newly defined standard was scheduled for the medium term. In the interim, the initiative had to build an awareness of process management, so the training on the concept of process management at RC Poland had to be completed within 24 months. Standardized frameworks, such as the Business Process Excellence regulation (BPE policy) also had to be adopted. The BPE policy formulates the process standards SIPEX, which replaces the previous referential processes base RPH. Process roles, including the roles of process sponsor, process owner, and process manager, had to be defined. Tool support for processes design and visualization had to be adopted [The corporate process tool is ARIS (Scheer and Nüttgens 2000)].

In the Polish organization, the program, named "Streamlining Business Processes," was formulated as a vehicle with which to implement the process organization. A chief financial officer (CFO) was the sponsor, and the head of the BPM team was the program manager. The program scope was divided into three areas:

- Streamlining and improving all supporting processes (cf. Fig. 1: SCM, HR, FA, IT, etc.).
- Adjusting the core business process as much as possible with respect to the BPE corporate policy (standards, roles, corporate tool) while extending the scope to every business process in use in the Polish organization during the program realization because of growing demand from the business leaders.
- Conducting the appropriate training on process management policy.

The program team consisted of members of the BPM team, and although the initial schedule spanned more than 2 years, it was soon extended and is now maintained as an ongoing business since the formalized process management approach has become an established part of the organizational culture.

The processes were supposed to support the implementation of the company's strategy, so the first activity of the program was to focus on the processes prioritization from the strategy perspective. This activity involved categorizing the existing processes into groups and assessing every process in terms of its importance and its influence on the business results. For instance, if the execution of any activity in the process could impact the business results (e.g., income, customer or vendor relationships), the whole process was assigned to the high-priority group.

Based on that decision, every high-priority process was assigned a process sponsor, an owner, and a dedicated project team of business representatives and a process consultant. The project had a clearly defined goal, a scope, and a timeline that was aligned with the master BPE implementation program schedule. Therefore, the scope of the whole program was based on the list of high-priority processes, an approach that helped avoid scope creep. The approach also helped to keep the BPE schedule on the agreed timeline. After the scope was agreed upon, the processes were set in a sequence that supported a business logic (sales, realization, and service). This logic was deployed in each business by streamlining the detailed processes several times so almost the whole company was covered by process maps and process excellence.

3.2 Implementing the BPM Initiative

The purpose of the BPM initiative was to improve the quality of the company's processes, so quality standards for processes and projects were fundamental. Quality standards can be met only by adopting standardized processes that all employees can use while still providing transparency and relatedness across projects. Standardization also facilitates the synergies by using continuously refined best practices, so a standardization initiative was enacted.

However, before the standardization could take place, processes had to be identified. To address this task, Siemens took the BPM lifecycle model as a reference (Dumas et al. 2013). The BPM lifecycle consists of an initial phase of process identification, where the process boundaries are defined, and then iterates the process through five activities in a loop that iteratively improves the process (cf. Fig. 2). The actions taken fit into the first four activities of the BPM lifecycle: process identification, process discovery, process analysis, and process redesign.

These activities of the BPM life-cycle were conducted through workshops and tutorials that involved the organization's hierarchy. The adopted approach to implementing the BPM policy are described in Fig. 3 as a five-step process.

Step 1. Identify Business Process Owners
Several meetings were organized with the business process owners (typically the managers of the divisions) to discuss the advantages of adopting BPM by comparing current performance indicators with possible values after adopting BPM.

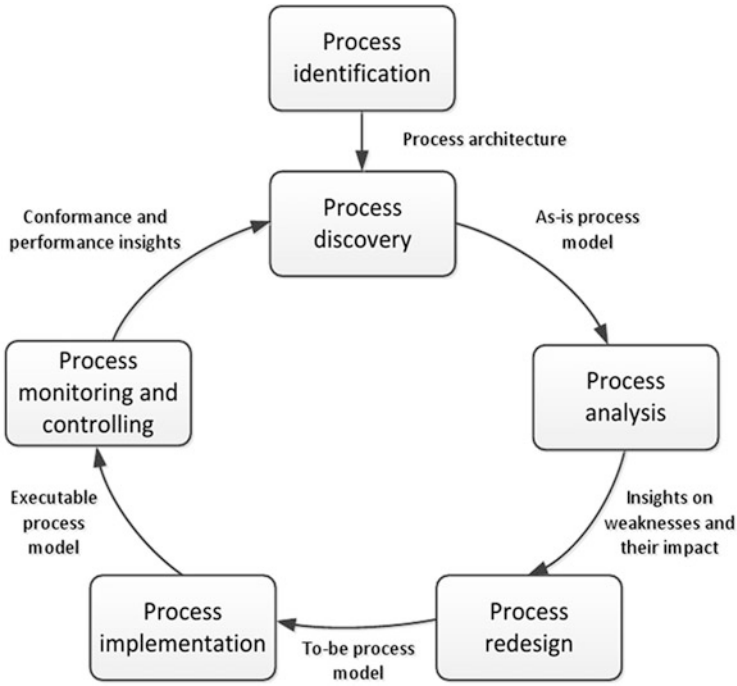

Fig. 2 The BPM lifecylce (Dumas et al. 2013)

Fig. 3 A five-step process for implementing the BPM policy

Step 2. Nominate Process Sponsors
Process sponsors were nominated to be responsible for about 20 business processes. Their task was to facilitate and drive the management of these processes.

Step 3. Assign Process Owners
The process sponsors nominated process owners to be responsible for one or two processes.

Step 4. Conduct Workshops
Process owners, project managers, and the employees (domain experts) who were involved in the processes were invited to workshops in which process identification (from whiteboards to as-is processes) took place.

Step 5. Systematically Refine the Process
At the first stage, workshops were held throughout the company every 2 days. Then their frequency became weekly or monthly based on the progress of the identification phase and the affected employees' learning curve. The project was expanded to a period of 3 years, so it is still ongoing in a continuous-refinement fashion, with around 300 people participating.

Applying the methodology came with the need for some practical changes:

- **Involving the project managers**: Project managers had often been give unrealistic goals that made them unaware of the real process or caused them to misunderstand the relevancy of the work. The main reason for this issue was that there were no processes defined. Project managers would seek higher production goals, allocated by process-unaware sectors. Under these circumstances, project managers were unable to fulfill their contracts.
- **Involving the financial controllers**: Prior to the initiative, financial controllers were not involved in processes. Involving financial controllers in the workshops meant designing the processes taking the accounting, budget, audit, and other finance-related perspectives on the process into account.
- **Involving the buyers**: Buyers had not been involved in the processes, but involving them was helpful in aligning the process goals and identifying non-value adding activities.
- **Acceptance of the change**: Many employees were experts in their domains but were unaware of the business process that affected them. As a consequence, resistance to changing their habits and adopting new tools was encountered. Although, the resistance to technology was not particularly high, the ARIS process modeling tools found some obstacles in adoption.

3.3 Methods and Tools for Business Process Excellence

Once the processes were defined, designed, improved, and documented, we used existing proprietary tools and frameworks to implement our solution.

Project Business@Siemens Professional project management was a key success factor for Siemens because nearly half of its revenue comes from "project business," that is, business that requires implementing a project. Siemens' customers expect that their projects will be handled professionally and responsibly. In the future, Project Business@Siemens will support the comprehensive and continuous improvement of all Siemens units that are active in the project business. The aim is to add value to the worldwide operations and processes of the divisions and lead countries by supporting them in reducing the risks associated with project business and achieving operational excellence.

Quality Management Siemens delivers excellent quality by following its quality strategy: implementing the mandatory elements of Siemens' quality management and continuously improving the quality of the personnel, the processes, and the products.

Operational Excellence The Operational Excellence department offers methods and processes that address function-specific areas like engineering, product management, and production, as well as the business areas of software and services. The businesses can make measurable and sustainable improvements by applying these methods and processes.

Operational Excellence also assists the business units as a partner and a service provider by supporting them in continuously improving their processes (e.g., in engineering, product management, and production). The department, which is comprised of benchmarking and productivity management, encompasses top+, 3i,[1] and other important approaches to increasing competitiveness. Lean is addressed in Operational Excellence's various departments.

An ongoing exchange of knowledge among the business areas is ensured by close collaboration with the divisions and business units.

Process and Production Consulting Internal process and production consultancy strengthen the competitiveness of Siemens' businesses along the global value chain. Consulting services draw on extensive expertise in the areas of innovation, research and development, engineering, procurement, supply chain logistics, manufacturing, services, and project and crisis management. Process and production consulting enables Siemens units to implement world-class processes successfully and sustainably.

top+ top+ provides the framework for business excellence and supports our businesses in cutting costs, increasing revenue, and optimizing assets. Key elements are the top+ approach (transparency, clear goals, concrete actions, definite consequences); the top+ Toolbox, which provides proven Business Excellence methodologies; and sharing of best practices. The main tool for top+ is business benchmarking, which assesses qualitatively and quantitatively market position, sets targets based on best practices, acquires outside learning and external knowledge, and undertakes continuous process improvement. The top+ Business Benchmarking Process consists of hypothesis generation, data collection, analysis and gap calculation, scenario-based simulation, definition of actions, and implementation.

Business Process Analysis and Optimization Siemens uses standard tools for process documentation, modeling, and publication. The process owner for BPM on the corporate level is responsible for specifying the standard tools and related services. The standard tools for Siemens' BPM are ARIS and the internal tool Dynamic ProcessWorld (DPW). These software tools provide a framework that supports users from process definition to process execution. These software tools

[1] 3i, which stands for ideas, impulses, and initiatives, is the idea-management program at Siemens and is an element of continuous improvement.

are embedded into a software architecture that takes into account KPIs (e.g., number of offers, hit rate, average order value per sales channel) and supports execution. Analysis and optimization can be done by analyzing the process execution logs to identify the as-is process and compare it to the designed process.

4 Results Achieved

Three areas were improved by implementing the corporate BPM policy.

Simplification The corporate process structure benefitted in terms of simplification, which entails increased flexibility, reduced manual conventions, and reduced number of processes. Flexibility increased because process changes can be easily modeled, executed, and shared among the divisions. New manual conventions were reduced by more than 60%, leaving space for standardized processes. The number of resource roles was reduced from eight to three: process sponsor, process owner, and process manager.

The process sponsor, typically the CEO of the organizational unit or a person from the top management level appointed by CEO, is in charge of defining the process portfolio, appointing the process owner, and promoting the process management topic. The process owner is responsible for handling a process in terms of planning, budgeting, implementation, communication, monitoring, interfaces, and target-setting. The process manager, selected by the process owner as an expert in the process, supports the process owner in the operational implementation, suggests improvements, and is the primary contact for process users.

Usability Usability was improved in terms of visualization of the processes and increases in the supporting tools' ease of use. Such is particularly the case with the process-unaware divisions, which moved from managing large spreadsheets to enhanced process visualization and graphical navigation provided by the ARIS tool. Moreover, the improved process structure helps to clarify and retrieve information about the process.

Clarity The new BPM program brought improvements in terms of clarity. The standardization of processes on the firm level reduced the number of regulating circulars from three to one and the number of regulating control requirements from three to two. Moreover, the program clearly defined the process owners and their responsibilities and introduced a new policy as an overarching framework.

Business Process Excellence (BPE) is currently adopted on the corporate level and has become a fundamental element of BPM at Siemens, in line with the Vision 2020 project. It is embedded into the Corporate Technology structure, so it is part of innovative products and management standards. BPE is also a key lever that facilitates the company's lasting business success and strengthens its competitiveness. One of BPE's objectives is to optimize the entire value chain across all business types: product, project, and service businesses. The foundation of BPE is

a culture of continuous improvement, openness, and trust that is anchored Siemens-wide and is "lived" by all employees in their daily work.

Another goal achieved was the establishment of a knowledge center that bundles all the essential tools for the businesses' operational improvement, such as top+, Quality Management, PM@Siemens, and 3i, and helps to make knowledge at Siemens usable for the company as a whole in the form of a corporate memory.

By using top+, Project Business@Siemens, Quality Management, and Operational Excellence, the Business Excellence department, the Quality Management department, and the top+ department bundle all of the corporate resources, essential improvement tools, and expertise needed to achieve business excellence. The implementation of the tools in practice is also supported by the Process and Production Consulting unit.

5 Lessons Learned

Four primary lessons were learned from the program at Siemens:

- Complexity in many dimensions (number of processes, number of roles, number of formal documents, and circulars) is not supportive of effective process management.
- Having a strong, dedicated process sponsor is one of the most important keys to success.
- The entire organization will not appreciate the work at the beginning, but they will if one does her or his best to understand their businesses and support their efforts.
- Be flexible: Failure to align the businesses with the corporate recommendations will lead to lack of appreciation and cooperation.

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