INCREASING EFFICIENCY AND EFFECTIVENESS IN LARGE COMPANIES BY COMBINING SIX SIGMA WITH BPM

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Abstract
The paper underlines the importance in combining the Six Sigma methodology with BPM technology. Companies are just discovering the benefits of combining BPM and Six Sigma. Ideal for enhancing the long-term performance of business processes, the BPM/Six Sigma union helps companies better characterize, understand, and manage entire value chains. It also helps companies improve control and predictability of corporate business processes and generate sustainable enterprise improvements in performance levels.The study starts with the concept of Six Sigma which was powered by principles governed by continuous improvement. In pure terms, Six Sigma helps manufacturing organizations reduce the number of errors or reduce the number of defective products manufactured by them. This is achieved by a regular sharpening of the process and constant monitoring on processes and how they can be improved. This approach had been truly effective in ensuring quality in a manufacturing environment and was later adopted by the services industry during the 90s. However, as the Six Sigma framework relied heavily on the collection and analysis of data of individual processes, synchronizing them between departments was ignored. This resulted in improvement benefits being limited to specific functions only, without taking into consideration the integration with other processes. Another weakness of the Six Sigma methodology is the lack of control used to sustain improvements achieved. This stems from the fact Six Sigma utilizes manual processes to do this, an approach that lacks effectiveness. In this sense, Business Process Management (BPM) initiatives address areas that Six Sigma falls short of, in line with the purpose of achieving excellence in organizations. These two methodologies complement each other to compensate for areas of weaknesses. Although BPM addresses process enhancements and monitoring from a holistic viewpoint, it fails to address the analytical requirements to solve complex issues.

Keywords*: Six Sigma, BPM, efficiency, effectiveness, managerial tool*

1. Introduction

The managerial tools and the methodological elements used in running of complex managerial initiatives, inclusively in promoting and using them represents, with no doubt, the fundamental combination of the managerial, economical and commercial success of any organization; proper knowledge and operationalization of the most adequate systems, methods and techniques of management provide a favorable answer to the question: How do we lead?

This is why ,in the following pages ,we approach two of the most representative managerial tools Six Sigma and BPM (business process management) which combined sustain the idea that the managerial methodologization is the most facile modality of amplifying the efficiency and effectiveness of any large company.

This article focuses on answering following questions. What is BPM? .What is Six Sigma? .How can BPM and Six Sigma combined increase effectiveness and efficiency?

2. What is Six Sigma?

The concept of Six Sigma was developed at Motorola in the 1980's as they worked to improve the quality of their products and services. By implementing a systematic, rigorous routine, they were able to improve their products and increase customer satisfaction, thus increasing profits.

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Six Sigma can be in many ways defined. It's a way to measure processes, a goal of near perfection, underlined by the 3, 4 defects / million occasions, an approach to change mentality. The best definition is by far this one: Six Sigma is a vast and comprehensive system to achieve and support efficiency, effectiveness in other words performance.

Any organization who wishes to implement Six Sigma methodology should bear in mind six vital points.

1. A real focus on costumer. The necessities of the customer should always come first
2. Managment based on facts and data, with efficient measurement systems witch follow up on results and systems outputs, but also processes, system inputs and other predictable factors.
3. Focusing on process, management and improving the process. Six Sigma keeps track of all processes through documentation, measurement indicators …
4. Proactive management. Sis Sigma anticipates problems and changes, using facts and data and always checks the hypothesis regarding organizational objectives.
5. Collaboration without limits between all actors involved in the organization (internal and external clients)
6. Impetus to perfection and yet failure tolerance. This approach offers employees freedom to test new approaches even when risk are attached to them. Only an organization who wants to seek new methods of improving is on the long term sustainable.

Six Sigma approaches business processes from a highly statistical standpoint. It incorporates three levels of activity:

- Metrics – statistical focus to make process outcomes 99.9997% defect free, otherwise expressed as 3.4 defects per million opportunities
- Methodology – structured approach to solving problems that uses specific tools and process mapping to achieve the metric goal
- Philosophy – the enterprise-wide embrace of defect reduction by making decisions based on hard data and customer focus

In short, Six Sigma allows an organization to reduce the variability in its products and services so that waste is reduced, efficiency is improved, and customer satisfaction is dramatically increased. Business problems are solved through rigorous application of data collection and analysis tools. The training that Six Sigma users receive is quite intensive, progressing through several increasingly sophisticated levels based on experience and accomplishment. Professional Six Sigma consultants and practitioners usually work to become certified at the various levels, increasing their ability to help guide development and implementation of Six Sigma methodology.

The methodology of Six Sigma is key to its success. An organization follows a five step progression that uses factual information and statistical analysis to address achievement of operational goals. There are some differences in the five steps depending on whether they are used to improve an existing process or design a new process. The end goal, though, is always to achieve the standard metric of 99.9997% defect free performance.

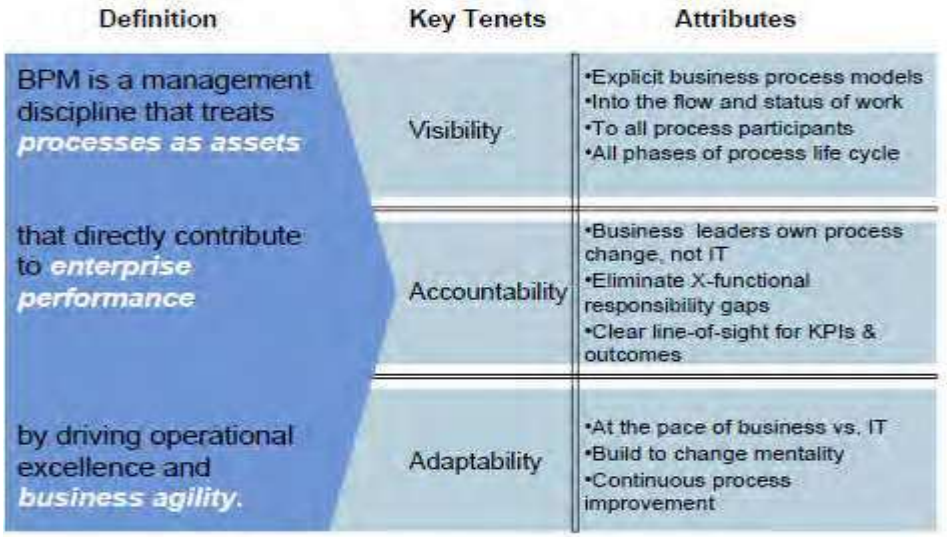
3. What is BPM?

Business Process Management (BPM) has become a top priority for companies in 2006 and 2007. A recent survey of more than 1,400 CIOs revealed that the top business priority identified by their company was business process improvement. Of course, there are many options for improving business processes – ranging from complete process re-engineering to adopting new process management methodologies, such as Six Sigma, or adding new capabilities to existing systems. An investment in BPM software, coupled with new approaches to project

implementation , enables companies to institutionalize a sustainable business process improvement program.

Business process management (BPM) is a holistic management approach focused on aligning all aspects of an organization with the wants and needs of clients. It promotes business

effectiveness , efficiency and agility while striving for innovation, flexibility, and integration with technology. BPM attempts to improve processes continuously. It can therefore be described as a "process optimization process." It is argued that BPM enables organizations to be more efficient, more effective and more capable of change than a functionally focused, traditional hierarchical management approach. Other define BP as a management discipline that treats processes as assets that directly contribute to enterprise performance by driving operational excellence and business agility.



4. How did we get to BPM?`

The managerial tools and the managerial methodological elements are in a perpetual change . From the earliest taylorist scientific management to computerized processes (JIT) to re-engineering (Six Sigma, Lean) , and currently to BPM.

- **Scientific management** was a theory of management that analyzed and synthesized workflows. Its main objective was improving economic efficiency, especially labor productivity. It was one of the earliest attempts to apply science to the engineering of processes and to management. Its development began with Frederick Winslow Taylor in the 1880s and 1890s within the manufacturing industries. Its peak of influence came in the 1910s; by the 1920s, it was still influential but had begun an era of competition and syncretism with opposing or complementary ideas. Although scientific management as a distinct theory or school of thought was obsolete by the 1930s, most of its themes are still important parts of industrial engineering and management today. These include analysis; synthesis; logic; rationality; empiricism; work ethic; efficiency and elimination of waste; standardization of best practices; disdain for tradition preserved merely for its own sake or merely to protect the social status of particular workers with particular skill sets; the transformation of craft production into mass production; and knowledge transfer between workers and from workers into tools, processes, and documentation.: While scientific management principles improved productivity and had a substantial impact on industry, they also increased the monotony of work. The core job dimensions of skill variety, task identity, task significance, autonomy, and feedback all were missing from the picture of scientific management. While in many cases the new ways of working were accepted by the workers, in some cases they were not. The use of stopwatches often was a protested issue and led to a strike at one factory where "Taylorism" was being tested. Complaints that Taylorism was dehumanizing led to an investigation by the United States Congress.

Despite its controversy, scientific management changed the way that work was done, and forms of it continue to be used today

- In the 1970s, when Japanese manufacturing companies were trying to perfect their systems, Taiichi Ohno of Toyota developed a guiding philosophy for manufacturing that minimized waste and improved quality. Called Just In Time (JIT), this philosophy advocates a lean approach to production, and uses many tools to achieve this overall goal.

When items are ready just in time, they aren't sitting idle and taking up space. This means that they aren't costing you anything to hold onto them, and they're not becoming obsolete or deteriorating. However, without the buffer of having items in stock, you must tightly control your manufacturing process so that parts are ready when you need them.

When you do (and JIT helps you do this) you can be very responsive to customer orders – after all, you have no stake in "forcing" customers to have one particular product, just because you have a warehouse full of parts that need to be used up. And you have no stake in trying to persuade customers to take an obsolete model just because it's sitting in stock.

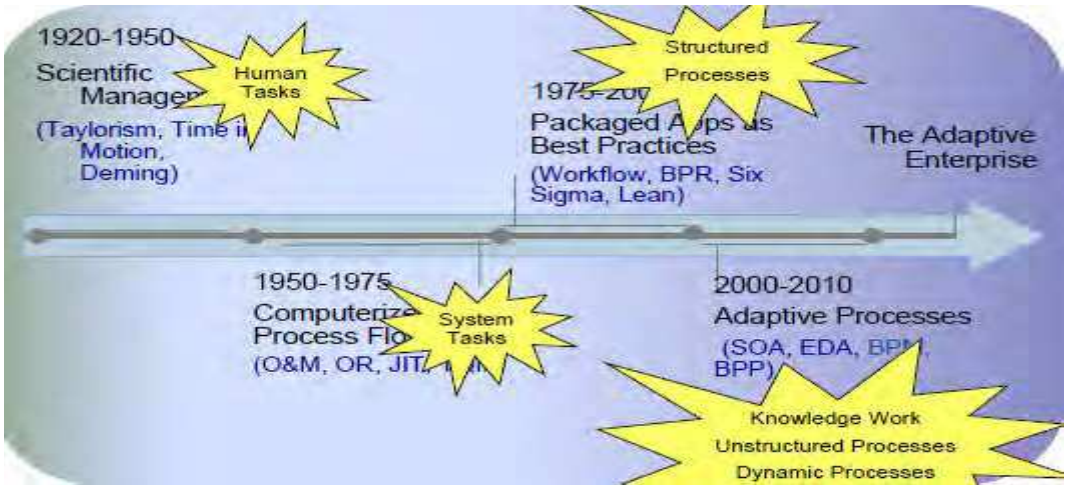
The key benefits of JIT are:

- Low inventory
- Low wastage
- High quality production
- High customer responsiveness.

A key drawback of JIT is that it only works if you can rely on your suppliers to deliver when they promise to – otherwise your whole operation may grind to a halt.

What's more, if material costs suddenly increase, then storing them at a lower rate might have been a more economic option. And JIT is also based on historical patterns of need: If orders increase sharply, adjusting to the increased need for supplies may not be easy for you or your suppliers.

- In the early 1990s strategists Hammer and Champy introduced the concept of re-engineering ,a tactic also known as business process re-engineering (BPR). The key to BPR is for firms to look at their business processes from a "clean slate" perspective and determine how they can best construct new and existing processes to improve the overall conduct of business . BPR constitutes the complete re-alignment of the firm and requires the company to be built from the bottom up . Hammer and Champy defined BPR as : "The fundamental rethinking and radical redesign of business processes to achieve dramatic improvements in critical ,contemporary measures of performance such as cost, quality ,service and speed**.** Six Sigma is probably the best method of reengineering a company . With all the positive things that people have to say about Six Sigma, there are also plenty to go around that aren't so positive. With any system that relies heavily on data and measurement like Six Sigma does, it may sometimes be difficult to gather sufficient data and this can be a big problem especially when big tactical decisions are being made based on the date collected. There are even times when a particular type of data or measurement may not even be available at all. Gathering and finding out ways to gather data when it is not available can have a very significant cost to the company in terms of time and effort. Prioritization can also become a problem when Six Sigma is being used because it so critical to the success or failure of the implementation. There are very few tools that have been developed that help make objective decisions regarding prioritization.



5. BPM basics

Let's first take a look at the basics of BPM. It uses a four step method to create better processes and improve performance. The steps are as follows:

- Map the process (whether new or existing) from start to finish, capturing each step along the way
- Execute the process by using people and automated applications, with specific assignments of responsibilities and accountabilities for each step
- Manage the process through information flow, actions and related activities Analyze process performance and metrics, using findings as the basis for continuous process improvement

BPM has a strong base in software applications to help streamline and automate processes. At the software level, BPM is commonly applied within a single department or group to improve a specific process.

From the software level, BPM expands to a suite of software applications. The suite level enables BPM to link multiple departments or groups that affect processes. It promotes information sharing and accountability through use of a work portals where multiple users can share knowledge, documentation, and process management.

At its highest level, BPM expands to an enterprise-wide system. This level combines software and IT aspects with management practices to address broad structural and systemic issues within a business or organization. Business practices and operations are examined from a holistic standpoint, paying close attention to how occurrences in any one part of the system have a ripple effect across the organization.

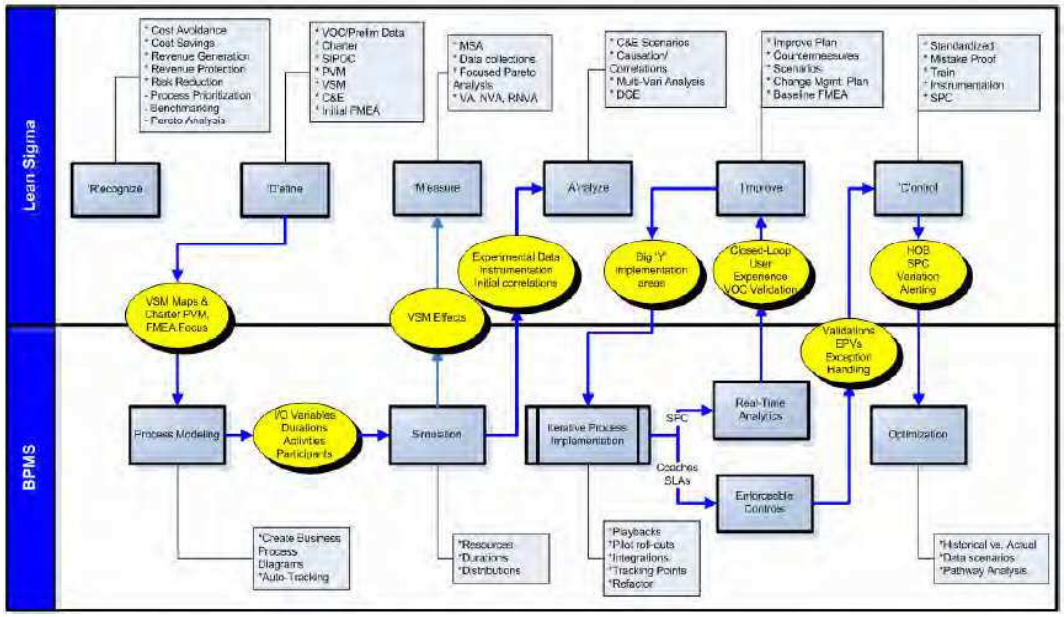
6. A Common Objective

Fortunately, both BPM and SS have a similar goal in mind – allowing companies to better manage and optimize their processes. Their approach and focus, however, is different. SS has a focus on understanding the variance in processes and how that affects the ability to achieve key objectives. One of the challenges of deploying SS across a company is that it is labor intensive to gather the data and implement the controls that are recommended by analysis. This, of course, is one of the key benefits of implementing BPM – automated controls and data gathering about the performance of the process. At the same time, many BPM teams struggle to understand which processes are the top priority for the business and which problems are the most critical to solve for any given process. SS

has much to offer BPM teams in this area – through tools like Failure Mode Effect Analysis (FMEA) and Value Stream Mapping (VSM). So, conceptually, BPM and SS should be a great fit.

Conceptually, most people will agree that connecting the data-driven focus of SS improvement with the real-time controls and automation of BPM could increase the efficiency and effectiveness of a company . The question would be, why haven't more companies succeeded at connecting the two initiatives. The problem could be the education and specific definition about points of integration. While BPM and LSS teams can tell you how their specific activities integrate and complement each other in their OWN disciplines, there is little insight into how to hand-off between the two. Lance Gibbs and Tom Shea believe there are eight basic touch points between the two initiatives. It is critical that these touch points are managed if a company is going to integrate their BPM and LSS initiatives.

7. The Eight Touch points of LSS and BPM



1. **Value Stream Maps (VSM), Charter and Failure Mode and Effects Analysis (FMEA) –**

Several of the assets created in the "Define" step of Lean Sigma are helpful to BPM teams when they start their process modeling. In particular, the VSM helps the BPM team understand the key areas of focus for their process modeling and how specific processes contribute to overall value to the company. Furthermore, FMEA provides BPM teams with insight into particular failure points that their process models must factor in and mitigate. Without these inputs from the LSS efforts, a BPM team might struggle to understand where they should truly focus their modeling efforts.

2. **I/O Variables, Durations, Activities, and Participants –** From the value stream map we can now begin to add the data that surrounds the key input and output variables. Cycle time, lead-time, and WIP as well as the human and system consumers who interact with the process – all need to be included by the BPM implementation.

3. **VSM Effects** – BPM simulation capabilities provide a strong initial baseline of data about the process. Instead of having to wait for several weeks of sampling, LSS teams can start analysis

using projected performance information provided by the BPM system. Initial multivariable studies can be run using the pathway analysis and resource thresholds generated by simulation from BPM, providing an early litmus test of the areas of opportunity for improvement.

4. **Experimental Data, Instrumentation, Initial correlations** – Simulation data generated from a BPM solution can also be leveraged to create SPC charts. This data also allows the LSS team to begin to validate process capabilities on future state. While LSS teams could gather all of this information without BPM, it would take time and effort – and they would not have key data as early. Leveraging the BPM data can remove one of the biggest bottlenecks for LSS teams.

5. **Big Y Implementation Areas** – As part of their work in the "Improve" step of an R-DMAIC approach, the LSS team will produce an Improvement Plan. This document is a great asset to the BPM team as they make the process executable – not just simulated. In the BPM world, the best practice is to implement process applications iteratively. During that implementation process, one of the biggest challenges is to keep teams focused on solving the top priority problems. Knowing the Big Y implementation areas gives the BPM team a concrete understanding of which problems to solve – without them having to go and repeatedly interview the organization to distill that information.

6. **Closed Loop User Experience** – An executing BPM solution provides control over activities and generates performance data from the process consumers that can be used for improvement base lining in LSS. Since the process that was designed is the process that runs, change is automatically enforced and failures can be identified in real-time. This automatic control and data collection greatly simplifies the workload of Black Belts and Green Belts on the LSS team who would otherwise have to enforce controls and gather data themselves.

7. **Validations, EPVs and Exception Handling** – The key exception handlers are in place for the most critical FMEA input variables that need to be closely monitored. The right information is now available to identify countermeasures as the process begins its inevitable shift from compliance to non-compliance in meeting the customer requirements. This information is fed in real-time in the right format to the LSS teams.

8. **SPC, Variation Alerting** – Today, most BPM solutions treat business event alerting in a simplistic fashion. For example, alerts are generated for late work items or when certain data conditions are met (e.g., loan application over $250,000). SPC instrumentation allows managers to understand the relevance of specific events. Variation alerting helps a process manager focus – telling them only when significant events happen. This discipline and approach must be integrated into the BPM dashboards that end users leverage to drive process performance.

8. Conclusions

BPM coupled with Six Sigma is the best investment a company can make in establishing a platform for continuous improvement and a managerial tool that can measure processes and improve them close to perfection(3.4 defect/ million occasions) .. Companies have different levels of maturity in adopting BPM and/or SS. However, those that have successfully implemented and integrated their BPM and LSS initiatives are able to answer ,"Yes," to all of the capability statements in the following list.

Capability	Yes or No?
Process Visibility from the value stream map of the business, with the processes broken down to the procedural level.	
A real-time dashboard with control charts at the procedural level, up to Executive Health of the Business gauges that can be used to monitor the whole corporation, lines of businesses, functions, or processes with full drill-down capability.	
Ability to incorporate Statistical Process Control (SPC) charts to monitor in real-time the process performance against the voice of the customer in time, quality, and delivery, and, most importantly, their "stable" processes alone.	
Simple to use Process Modeling tools for the process owners at all levels, to provide standardized process mapping and standard work documents, and simulations capability.	
Proactive: The ability to notify users immediately when out-of-control conditions occur, so process owners and process specialists can capture the root cause for corrective action or for best practices implementation.	
Relentless Voice of the Customer driven process requirements and the subsequent method to gather, prioritize, and validate compliance.	
Visibility into and accountability for process performance against voice of the customer SLAs.	
Live updating of Process Improvement Prioritization matrix, aligned with the Company Strategy, to assure that available improvement resources are assigned to the improvement activities with the most impact.	
Rapid prototyping of new products and services using process simulation (DMADV).	
An efficient workflow to implement the best "future" state process, usually yielded by Kaizen Events.	
Mining process capability against VOC for improved and new products and services.	

The challenge for many companies is justifying the BPM coupled with Six Sigma investment instead of using traditional paths for solving process problems – like buying an application or building a custom application. We feel that only BPM coupled with Six Sigma can help you're company answer "Yes" to all the above question, which automatically will increase efficiency and effectiveness .

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