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IBM Information Management software

IBM BPM – The Foundation Tool for Public Sector Lean Six Sigma

The concept of process improvement is nothing new; history is littered with visionaries who were driven by an unremitting desire to radically change established business practices by extending the boundaries of conventional thinking.

Portrait of Henry Ford (ca. 1919)

Henry Ford: Process Pioneer

Henry Ford revolutionized the auto manufacturing industry, transforming the construction of automobiles from predominately small-scale, custom-made production to large-scale, standardized production using production lines. Such radical changes facilitated dramatic cost reductions, while at the same time delivering great improvements in productivity.

However, it took much longer for such radical thinking to find its way from the world of manufacturing to office-bound, paper-based processes. Even then, the initial impact of information technology was focused on eliminating many of the physical aspects of the process itself. For example, some of the most common uses of computer technology are the retrieval and presentation of information to support decision making. The use of databases, document imaging, and later Enterprise Content Management (ECM), has helped to improve the overall efficiency of process workers by freeing them from the physical constraints associated with the manner with which both structured and unstructured information is stored.

These benefits were achieved by minimizing the time taken to retrieve, analyze and assimilate the information pertinent to a specific task, while at the same time increasing the accessibility of the information allowing more tasks to be done in parallel. The ability to track what stage of completion tasks have reached and to audit who did what when on a task has also been of significant value.

Why Business Process Re-engineering Failed

The 1990s saw the rise of Business Process Re-engineering (BPR), which tried to take badly designed processes and replace them with better ones. The problem with this premise was that it was assumed that there were fundamental flaws inherent in the process design and that once these were addressed, then the full potential associated with this re-engineered process would be realized. It assumed that a re-engineered process could be deployed and essentially forgotten, with little or no thought given to the ongoing maintenance of process performance. With the dramatic acceleration of the pace of the business marketplace, it has become no longer sufficient to view process improvement as one finite event in the lifespan of a business process. Practitioners now understand that it must be viewed as essentially a continuous activity.

Lean Six Sigma: Striving for Continuous Process Improvement

The increasing need to continually improve businesses, in response to a variety of pressures such as the rapidly changing business landscape and the desire to reduce operational expenses, has resulted in an upswell of interest in a variety of quality initiatives such as ISO 9000, Total Quality Management (TQM) and Lean Six Sigma.

Six Sigma originated in the late 1970s from efforts to improve the processes at Motorola's Government Electronics Group (GEG). The application of already well-established statistical analysis techniques to minimize procedural errors proved extremely successful, eventually being adopted by organization such as GE, Honeywell and Fleet Boston.

The term Six Sigma comes from a statistical term (Sigma or "σ") used to describe the "standard deviation of a population." Sigma is a statistical term that measures how much a process varies from customer requirements. Sigma values can also be expressed as the number of defects per million opportunities for a defect to occur.

Sigma Value	Defects Per Million Opportunities (DPMO)
1	690,000
2	308,000
3	66,800
4	6,210
5	230
6	3.4

It is important to note that a six sigma process does not mean that 99.99966% of all units produced are perfect; rather this figure refers to the frequency with which defects will occur, remembering that any given unit may have multiple defects.

Lean is another process improvement methodology that is often used in conjunction with Six Sigma. Lean tools are designed to identify where wasteful activities occur in existing processes. By mapping out the "as-is" process, improvers can more easily visualize and identify pain points — and take corrective action. By creating a "to-be" process map, improvers create a process that reduces cycle time by eliminating wasteful activities.

Lean methods originated with the Toyota Production System (TPS), which enabled the automaker to achieve just-in-time deliveries from its suppliers. By elimination waste and reducing cycle time throughout the "value stream," inventories were significantly reduced and production was closely linked to customer demand. Six Sigma and Lean have been combined by many process improvement practitioners into Lean Six Sigma (LSS) combining the strengths of both methodologies. This White Paper will discuss how IBM FileNet Business Process Management (BPM) software supports LSS initiatives.

The Three Engines of Lean Six Sigma

There are three basic parts to a successful Lean Six Sigma program:

1. Process Improvement
2. Process Design (and Redesign)
3. Process Management

Process Improvement

Process Improvement is all about addressing the root causes of performance problems the execution of a process. In the context of LSS, this requires the identification (and subsequent elimination) of the causes of unwanted "defects" or errors produced by the process.

At the heart of LSS is the requirement that process improvement is a continuous process defined by the multi-phase DMAIC cycle (See Figure 1), where DMAIC stands for Define, Measure, Analyze, Improve, Control.

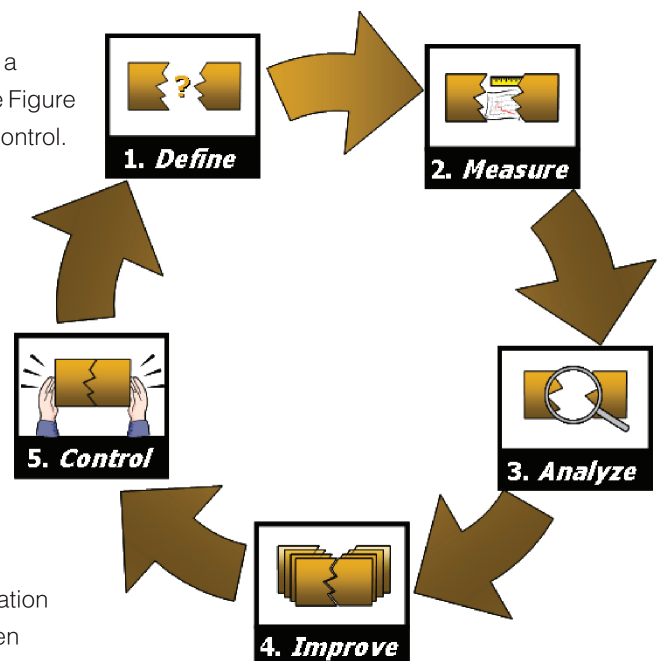

Figure 1 – The DMAIC Process Improvement Cycle

Process Design/Redesign

The DMAIC cycle can be implemented in a variety of business scenarios. However, there are circumstances when a slightly different approach is needed:

- When it is determined that the required level of performance is not attainable by improving the current process.
- When an entirely new process is required to address a newly identified opportunity, product or service.

As the focus of designing entirely new processes is more on innovation and less bound by the current process, the DMAIC principle is often adapted to emphasize ways to identify innovative effective ways to get work done. This is sometimes referred to as DMADV:

Define customer requirements and goals for the process/product/service

Measure and match performance to customer requirements

Analyze and assess process/product/service design

Design and implement new processes/products/services

Verify results and maintain performance

Some organizations still use "DMAIC" and merely adjust the activities in each phase of the cycle accordingly.

Process Management

The concepts of Lean Six Sigma apply not only to specific process improvement initiatives but also to the management of processes across large organizations and government agencies. This application of the DMAIC principle is the most radical as it often requires shifts in both culture and management throughout the organization in parallel with the LSS initiative in order for the benefits to be fully realized.

Supporting the DMAIC process with BPM

The IBM ECM suite of products includes FileNet Business Process Manager, which is an invaluable tool when engaged in a LSS initiative, because it plays an active role in each of the five steps of the DMAIC (or DMADV) cycle.

BPM in the Define Stage

The objectives of the LSS Define Stage are:

1. The creation of Team Project Charter and Work Plan
2. Identification of Measurable Customer Requirements
3. Definition of a High-Level Process Map

Creation of Team Project Charter and Work Plan

The Team Project Charter and Work Plan are just two examples of the variety of documentation that is generated as part of a Six Sigma initiative. BPM can provide a fully integrated content repository for the management of all forms of electronic content, including LSS related project documentation.

The repository allows for team members to add content to the repository and securely make it available to other team members. As these documents evolve, new versions can be checked into the system to ensure that when users access the documentation, they are looking at the most up-to-date version. The repository is fully indexed and searchable, allowing users to query the system for relevant content. IBM FileNet Content Manager allows the LSS initiative to have a single source paradigm where for key content items there is a document of record that all authorized users can access and always get the latest approved version.

Identification of Measurable Customer Requirements

The foundation of the Definition phase is the identification and articulation of customer requirements, which can be broken down into two main categories:

Output Requirements – These are features of the overall product or service delivered to the customer at the end of the process.

Service Requirements – These are related to the to the customers experience during the period of the processes execution.

The objective of both of these customer requirements is to quantify the success of a Process or Service in terms of the customer experience.

In addition to being able to manage the documentation of these customer requirements in the content repository, the powerful process definition environment of BPM can be used to embed these requirements into the process definition. BPM will not only measure the compliance with these requirements, but will automatically adjust the process to ensure that the custom requirement is met.

> *Example: If the Service Requirement associated with a Tasker or Work Order process is to notify the commanding officer of a recommendation within 15 days, the "Process Timer" system function can be embedded in the process definition to escalate the process in the event a recommendation has not been completed in, say, 14 days. This could involve the reassignment of the Tasker or Work Order to a "fast-track" process, elevating the priority to ensure that work items closest to their respective deadlines get processed first, or merely generating an email reminder to the person responsible for making the recommendation that his or her deadline is rapidly approaching.*

BPM is an excellent way of tracking and documenting performance against Service Level Agreements (SLAs) as it can provide an audit trail of the start and stop time of every step in a work process and who completed that step in the process.

Definition of a High-Level Process Map

BPM can be used to define a high-level process map using the fully integrated Process Designer (See Figure 2), which provides a feature-rich, web-based process definition environment. Using the Process Designer ensures a seamless transition through to the implementation layer in the DMAIC cycle, because a process defined in this tool is the basis for the actual implementation of the process at a later stage.

The Process Designer stores the process maps as XML documents in the fully integrated content repository and supports the XPDL standard. Given the teamwork associated with LSS initiatives, it is inevitable that team members will want to collaborate on the process maps. Content Manager associated with BPM ensures that the process maps are fully versioned and access to them can be restricted via security access control. This allows for the easy collaboration of team members on the task of documenting the different processes.

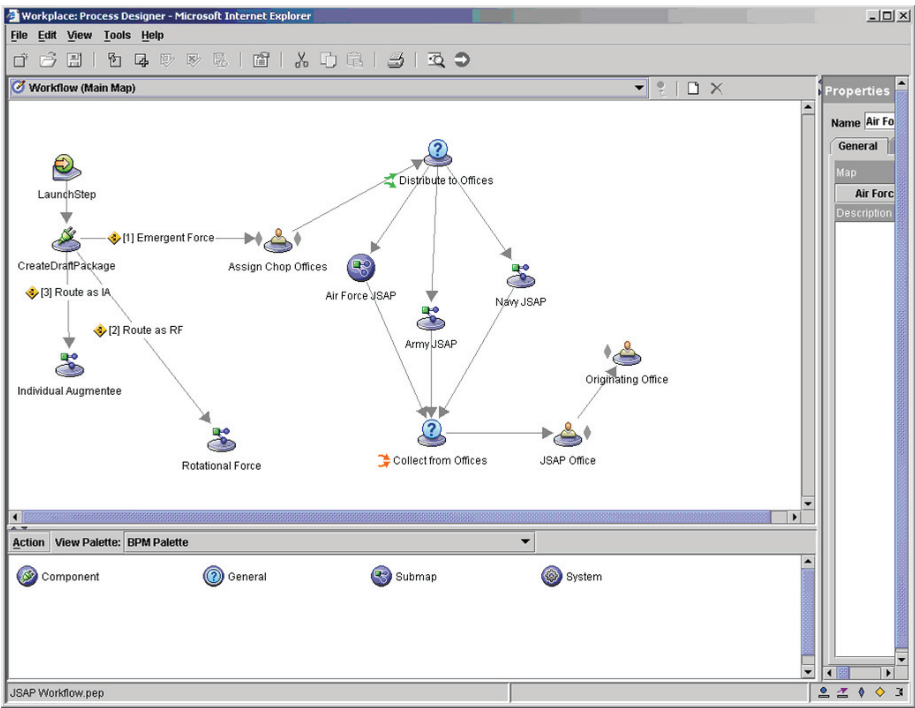

Figure 2 – BPM Process Designer Tool

BPM also supports the use of Microsoft Visio as an initial design tool to allow more participation from non-technical users by letting them use a simple desktop application. This is a full round-trip capability with Visio able to export process maps to the Process Designer in XPDL and get process maps back from Process Designer for display or modification using Visio. In particular, this is an easy way to make process maps part of a PowerPoint presentation for collaboration or feedback. It also allows for the connectivity of other third-party modeling environments such as MEGA, Popkin Software, Embarcadero Technologies and IDS Scheer.

Moment of Truth

Customer Service processes are typically associated with a “Moment of Truth.” In a federal environment a customer service process can be a citizen interacting through the Web with a government agency or it can be a government employee using self-service applications. The moment of truth is a point during the process where the user is in a position to form instant opinion about the web service or process. Therefore, the management of the various interactions with the customer is critical in meeting the customer requirements as defined in a Six Sigma initiative. BPM provides the ability for federal agencies to provide self-managed processes to both citizens and employees. These empower the “customers” to be in change of the various interactions they have with that agency. The embedded “publish and subscribe” process event model allows for the creation of processes that citizens or employees are able to initiate themselves. Web users may also be able to interact with a process that is awaiting approval or that requires additional information or action by the web user. This interaction with the customer may also leverage multiple communications channels, e.g. mail, e-mail, cell phone text message and voice. BPM has the ability to easily incorporate any and all of these channels into the business process.

> *Example: An expense reimbursement application requires addition information regarding travel orders. The request for this information is automatically sent via the customer’s preferred communications channel, in this case, e-mail. The email includes a fax cover sheet to be used when returning the required documentation. At this point the process is “pended” using an embedded “Wait for Condition” system function, causing the process to wait for the receipt of information from the employee. This function will wait for one or any number of defined events to occur and then the process is “unpended” when the necessary events occurs. If no event occurs, a timeout can be configured to prevent the process from being stalled indefinitely and/or send reminders of the information required. When the fax is received a barcode on the fax identifies the specific reimbursement request to which the information pertains. The addition of this document generates an event which triggers automatically the waiting application and instantly routes the travel order as an attachment to the expense report for the necessary processing.*

BPM in the Measure Stage

The measurement of process performance information is critical to the success of any process improvement initiative, LSS or otherwise. Six Sigma-based processes measure performance continuously and, in many cases, in real time.

The objectives of the Measure Stage are:

1. Develop metrics and measure baseline process performance against customer requirements.
2. Determine how prone the measurement system is to variation – and develop methods to reduce or eliminate this measurement system variability.

The manual measurement of process performance data is often a time-consuming activity prone to mistakes. BPM provides two fully integrated components that support the LSS Measure stage: the Process Tracker and the Process Analyzer.

The Process Tracker component provides visibility at both a micro and a macro level. At the micro level individual items of work can be tracked and the status displayed in real time. At the macro level as information goes through the workflows a complete record or each processed task is captured and saved for Milestone reporting. The Tracker provides a liner view of complex process execution graphs that are easy for business users to understand and use. The data captured by Tracker is available to the Project Analyzer.

In the past, process improvement efforts have very frequently been hampered by the time and effort required to collect data. This applies to the data required before, during and even after improvements are made. Using BPM allows for the automatic and timely collection and retrieval of process data. The expense of the many hours that were required for data collection can be eliminated by introduction of BPM. This ensures that the recording of process performance data is not only accurate to the fullest extent but also that collecting the measurement data does not impact the performance of the process itself.

Process Analyzer both accelerates and simplifies the collection of process related data. All relevant event logging and process data is streamed in real time from the Process Engine to the Process Analyzer where it is manipulated in order to populate five On Line Analytical Processing (OLAP) cubes.

The use of OLAP technology ensures information can easily be reoriented to provide the required representation right when it matters the most. The data cubes are extendable to ensure information is presented in the appropriate business context resulting in more rapid, accurate business decisions. Business process owners use the OLAP technology to more effectively and efficiently run their operations.

There are two main categories of measures:

Continuous Measures – these are things that can be measured on an infinitely divisible continuum or scale. Examples: time (hours, minutes, seconds) or distance (millimeters or miles).

Discrete Measures – these are things that can be sorted into distinct non-overlapping categories. Examples: asset types or base location (state).

Both of the above types of measurement are supported by the Process Analyzer which provides five OLAP data cubes that are fully extendible to include custom dimensions and measures that can be continuous and/or discrete. Adding process unique fields to the OLAP cubes enables business process owners to capture the most important measurements for their area of responsibility.

The five OLAP cubes are:

1. Work In Progress (Real-time cube)
2. Work Load
3. Queue Load
4. Process Cycle Time
5. Work Item (Task) Cycle Time

Example (Discrete Measure): If an organization wishes to measure the usage of the various types of vehicles that it has in the field, all that is required is that the data field that corresponds to the vehicle type be "exposed" in the event log using the BPM Configuration Console and then published as a dimension to one or more of the OLAP data cubes, such as the Workload cube, using the Process Analyzer Configuration Console. The Workload cube would then be able to be queried to determine the breakdown by type of vehicle by location or mission type. This breakdown of work could also be plotted against time to facilitate trend analysis.

Example (Continuous Measure): If an organization wishes to measure the time spent processing the various activities making up an approval of financial or health benefits process, no additional configuration is necessary as the Process Analyzer, in addition to processing event log data, also automatically receives data concerning the make up of all processes managed by BPM. This ensures that processes can be broken down into their component parts for subsequent analysis. This would then allow the benefit approval process to be presented in a variety of graphical forms, such as a pie chart displaying the how the time taken to process approvals is spent or the percentage of approvals completed on time by region. The accuracy of this information is ensured by the fact that the chart is based on the entire population of benefit approvals processed and not a sample.

The Process Analyzer populates the five OLAP data cubes automatically, using a direct feed from the Process Engine. This eliminates the need for users or administrators to manually tabulate the required information.

BPM in the Analysis Stage

The Analytics capability of BPM provides a variety of tools that can be used to analyze the performance data collected. These tools fall into two main categories:

Data Analysis – This uses data collected to find patterns, trends and other differences that can be used to determine the underlying causes of defects. As previously discussed, the BPM Process Analyzer provides five OLAP data cubes populated with process data for analysis. The use of OLAP provides a highly flexible framework for rapid, comprehensive analysis based any one of the various data fields published to the OLAP cubes.

Process Analysis – This takes a detailed look at the component processes that define the total business process in order to identify such things as cycle time, rework, downtime and other activities that don't add value to the Agency. The BPM Process Analyzer not only tracks data values, it also tracks information relating to the performance of the processes being managed. For example the Work Item Cycle cube tracks the performance of each task that makes up processes, i.e. how long they take to complete. This information can be broken down still further by extending the cube to include other user defined parameters such as failure type, parts availability, regional variations and vehicle age. It is possible to determine how each minute of the process is spent and document that vehicles over 3-years old stationed overseas take a significant longer time to repair than the same vehicles stationed CONUS.

The same three phases are common to both Data and Process Analysis:

1. Exploring
2. Generating a hypothesis about causes
3. Verifying or eliminating causes

Exploring

The investigation of the data and/or the process involves the use of a variety of tools to gain an additional level of insight in to the performance of the process. The data in the OLAP cubes can be used to generate a variety charts including:

Pareto Charts – These charts are a special type of bar chart the plot the frequency of particular type of defect. This allows organizations to focus on those specific defects with the biggest impact. Pareto charts can be created using the Process Analyzer, by simply defining a field, <defect>, in the process definition used to identify the type of defect, in the event that one occurs. When an error occurs in the process, this field is updated with the source of the error via an Assign system step, which simply sets the value of this field. This field is then exposed in the event log and subsequent published to the OLAP cubes as a dimension. his allows for the plotting of the frequency of occurrence of the various type of error.

Run (Trend) Charts – These can be used to identify process issues over extended periods of time. With the exception of the Work In Progress cube, which tracks live data, the data contained in the cubes is automatically recorded with respect to time. This allows the displayed data with reference to the desired time interval.

Histograms (Frequency Plots) – As one of the goals of LSS is the understanding and, where possible, reducing variations in a process, the plotting of process data in a histogram leads to an insight into the center and shape of the variation.

Hypothesis Generation

During the Analysis Stage, it is necessary to create hypotheses as to the root cause of defects or errors in the process. The use of the BPM provided OLAP cubes allows for the most complete view of the process performance information, allowing it to be view from numerous perspectives, thus ensuring the most complete picture of the processes behavior.

Verifying or Eliminating Causes

There are a variety of tools that can be used to verify or eliminate the causes of defects such as:

- Cause-and-effect diagrams
- Relations diagrams
- Scatter plots or correlation diagrams

The flexible nature of the OLAP data allows for hypotheses to be validated by looking at the data from multiple view points to ensure that the data is consistent with a particular hypothesis.

BPM in the Improve Stage

The goal of the Improve Stage is to find and implement solutions that will eliminate the causes of problems, reduce the variation in the process of prevent the problem from occurring. There are a number of steps for reaching this goal:

1. Identify a solution
    a. Generate creative solution ideas
    b. Cook the raw ideas
    c. Select a solution
2. Pilot test
3. Full-scale implementation

Identifying a Solution

Ideally the selection of a solution should be based, where possible, on quantitative information. BPM has an integrated Process Simulation environment that provides an excellent mechanism to determine the optimal solution. When process simulations are run they publish process analytics to the Process Analyzer in exactly the same way as actual live processes. This means that not only can the competing solutions be quantitatively assessed for their relative effectiveness, but the simulations can be also directly compared to the live system to ensure that any chosen solution will indeed improve performance rather than degrade it.

Pilot Test

The availability of a simulation environment within BPM that is identical to the production environment may render the partial deployment of the process unnecessary and accelerate the full deployment. In the event that a Pilot Test is desired, it is possible to deploy a pilot version of the process which will generate its own identifiable process analytics data. The Process Analyzer can then be used to directly compare the data collected about the pilot process with that of the incumbent process. The Process Simulator can be used as an improvement tool before or after the production process implementation. This quantitative analysis minimizes the risk associated in moving to a full-scale deployment.

Full-Scale Implementation

BPM provides complete version management of deployed processes. This dramatically eases the process of making process changes and modifications. Once a process candidate has been identified, BPM can deploy this as a new version of the process, without impacting ongoing work. The version management of the process definitions has the added benefit of allowing the roll back to a previous version of a process in the event that a process enhancement does not have a desired effect.

Proliferating the Gains from LSS Projects

With BPM an improved process is a standardized process – across shifts, departments and geographies. The need to create multiple "solutions" can be minimized, or eliminated altogether, since the IBM FileNet ECM suite not only manages content, but also facilitates the improved process. Incorporating BPM ensures that some of the lessons learned from early LSS efforts are taken into consideration:

- Process participants no longer have to rely on old systems that are poorly suited to manage the new, improved processes.
- When new systems such as ERP are introduced, they do not result in the same poorly performing process being automated so that the errors still occur, but they occur faster (and with more frequency).
- Participant intervention in the control plan is minimized, eliminating non-value-added "inspection" steps, the reliance of sampling plans versus population monitoring, and reducing manual measurement errors.

BPM in the Control Stage

It is vital that the benefits of any process improvement are maintained. Without effective control, a process may revert back to a previous state. Effective Process Control has four key parts:

1. Discipline
2. Documenting the improvement
3. Keeping score: establishing ongoing process measures
4. Going the next step: building a process management plan

Discipline

Maintaining a stable and predictable process requires discipline at both the personal and the organizational level. BPM elevates users from having to measure and monitor process operations. Once a process change is implemented BPM ensures the integrity of that process, i.e. process changes need not require conscious changes in user behavior. Users are simply presented with tasks in accordance with the new version of the process and may even be unaware of the change to the process.

Documenting the improvement

As the Improve Stage is nearing the completion, it is vital that the new process is fully documented, in order to identify what was changed and the reasons behind the changes. This is important so that the subsequent changes in the process performance can be put in the appropriate context. The integrated content repository provides a mechanism for BPM to manage not only the process definitions but also any additional process documentation that may be generated as part of the DMAIC cycle. The Process Simulator is specifically designed to take historical production data and determine if the process changes facilitate the requisite improvements in the business process.

Keeping Score

IBM FileNet Business Activity Monitor (BAM) offers real-time, operational visibility for organizations to closely monitor and respond to activity shifts. With this tool, managers are able to evaluate personalized views by role, job function or individual employee using rich, graphic dashboards that quickly relay critical information. BAM is coordinated with other data sources and able to tie automatic alerts to workflows, promoting not only operational visibility but also immediate response to changing business circumstances. This connection enables actions to be launched automatically without the need for human intervention.

BPM is greatly empowered by Business Activity Monitor. BAM delivers optimum, real-time operational monitoring by correlating with other business data to detect business issues and taking the appropriate action. The focus here is to reduce the response time from problem detection to ultimate resolution. Key performance indicators or KPI's are tied to key business objectives. In addition to historical views of performance, agencies can get an even greater real-time view of business performance in order to identify issues before they become problems.

BAM takes BPM to a whole new level of control. It provides real-time threshold monitoring and alerts along with comprehensive event detection and management and alerts can automatically start BPM actions. The data can be displayed on user configurable dashboards, aggregating date from multiple sources.

Going the Nest Step – Building a Process Management Plan

Having real time process performance measure is merely a pre-cursor to actually using this information to manage the process. A key element in this management is a process management plan that covers the following:

Current process map – The manager of the new, improved process needs to have a visual representation of the flow and the decisions in a process. BPM's graphical process definition provides a consistent, comprehensive view of the processes under management. This representation extends to the management of individual instances of work, where the Process Tracker can provide a graphically displayed context for point(s) in a given process where an instance work currently resides.

Action Alarms – While it is important to provide process owners comprehensive information regarding process performance, it is not enough to rely on them to be continually reviewing this data in order to identify problems when they occur. The integrated event base architecture of BPM enables the deployment of processes that have embedded Action Alarms. The use of process timers, process deadlines and step deadlines, enables actions to be taken automatically as soon as the event occurs, rather than waiting for it to come to the attention of a user. The integrated email notification can be used to generate informational alerts where manual intervention is required.

Emergency Fixes – Once an action alarm is triggered it is important to have a plan to remedy the situation, rather than rely on users improvising one. As previously stated, the procedures to address the circumstances surrounding the triggering of an action alarm can be embedded directly in the process definition, thereby ensuring that these exceptions are handled in a consistent, timely fashion. This concept can even be taken further to include situations that transcend individual process instance, but instead mandate a wholesale modification to the process. Process Simulation allows for different scenarios to be played out and a process to be tailored for a possible future situation. In the event that this situation occurs, this process can be rapidly deployed, thereby allowing business operations to be rapidly realigned to the current conditions.

Plans for continuous improvement – There is a reason that DMAIC is represented as a cyclical process, rather than a linear one. Organizations will continue to strive toward process perfection but this quest is made all the more difficult by the rapidly changing landscape that federal agencies are operating in today. The continuous monitoring of the process performance provides an additional process insight into the process and help to identify areas within the process for further improvement. The Process Analyzer provides this continuous oversight by presenting the necessary process measures in an easy to consume business context. Additionally, as the Process Analyzer handles all process related measures, both real and simulated, the Process Analyzer can not only track the level of performance, but also to verify that predicted improvements are actually realized.

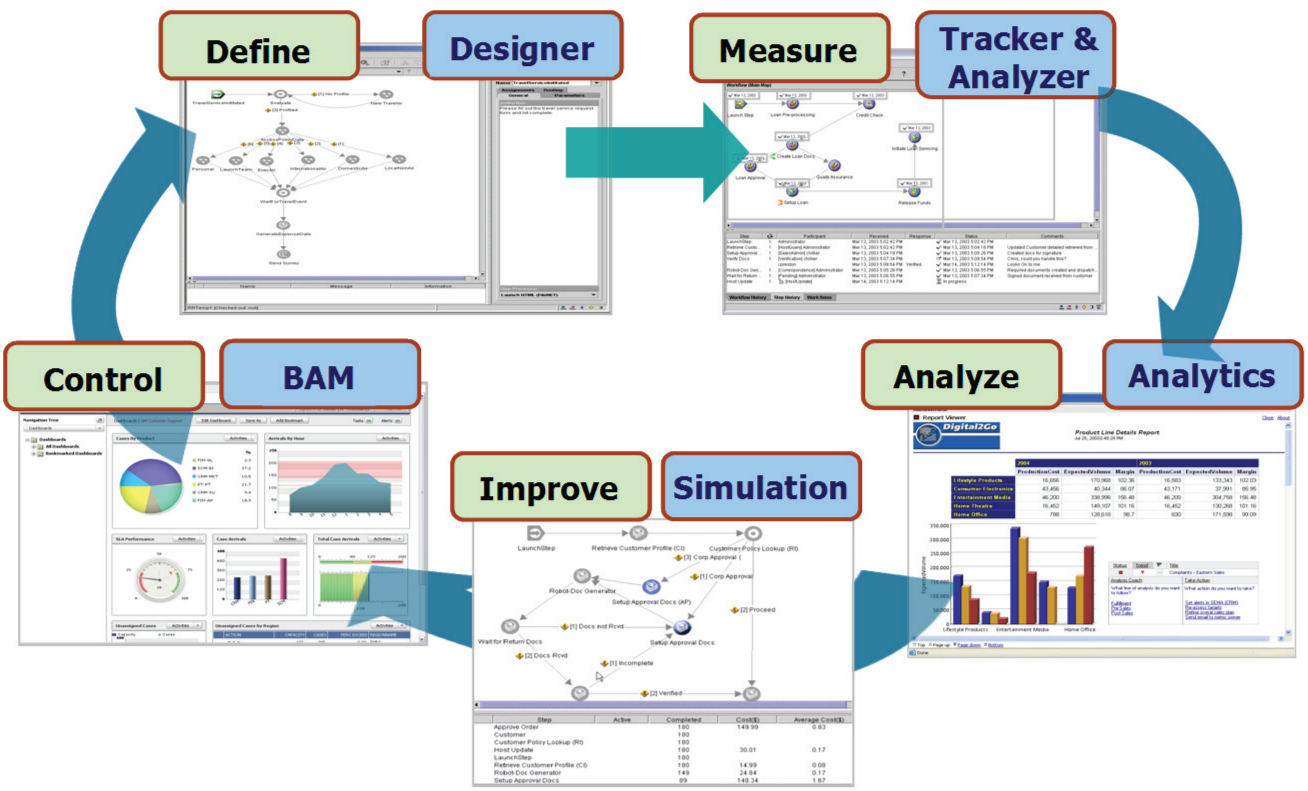

Figure 3 – LSS DMAIC and BPM

Summary

BPM provides a closed-loop environment for process improvement, accelerating the speed with which processes can be analyzed and ultimately improved. Figure 3 above shows the close fit between the DMAIC steps in GREEN and the corresponding BPM in BLUE.

- The rich process definition environment ensures that organizations are not required to compromise on the nature of process improvements ultimately deployed and they have a variety of ways that they can define and map their existing processes and evaluate changes to them.
- The Tracker captures data on the business processes are both the micro and the macro level for effective measurement, providing an invaluable insight into measurement of business operations facilitating the rapid identification of problems and the determination of their root cause. The Process Analyzer provides five OLAP cubes for different looks at the measurement data.
- In the Analyze stage the comprehensive Analytics uses the OLAP cubes to provide both Data and Process analysis with a broad choice of tools to visually represent the Lean Six Sigma analyses.
- At the Improve stage as well as the Define stage the Process Simulator can tie into the Process Analyzer to test different improvement scenarios and evaluate the impact of different levels of resources at different stages of the business process. The consistency of both the implementation and simulation environments allows for processes improvements to be tested prior to deployment, thus allowing processes enhancements to be deployed faster and more widely. As a result, this accelerates the realization of the benefits associated with process improvements.
- Business Activity Manager provides a configurable dashboard of metrics to support the Control stage of LSS. Real-time, data and Key Performance Indicators allow for effective measurement of results against business objectives.

By providing a unified environment for the implementation, analysis and simulation of business processes IBM's ECM software supports every stage of the DMAIC cycle and should be an integral tool in every Land Six Sigma initiative.

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