

Learning view over the implementation of business process optimizations

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Current context of great development and changes in the technological matters, national and global economies have to keep pace and undergone major changes. The ultimate aim of the companies and organization is to improve or optimize its business processes to cope with increased competitiveness in order to deliver more efficiently better products or services. The success of current businesses is linked to the efficiency but also the effectiveness of their core processes. Most part of the latest researches have recognized this importance leading to efforts concentrated on analyzing and optimizing the business processes. There are many techniques which are considered but also others which are not causing potentially significant opportunities of improvement not being addressed. However, currently, there is a scarce of an universal technique or methodology that can be used by the organizations to address business optimizations. This paper addresses different topics on how companies are analyzing the decision to initiate a business process optimization and how optimizations landed within organizations.

Keywords: *business process, optimization, efficiency and effectiveness of internal processes, business automation, optimization methodology.*

1 Introduction

Business processes have received ample attention during the last years. Many approaches and techniques have been discussed and proposed, there were many promises made, but the spectacular results that the reengineering and optimization revolution vowed were never fully realized. This made more and more people hesitant about the whole concepts.

As defined by the main relevant literature publications, Business Process Optimization (“BPO”) is the concept of redesigning the internal processes to promote efficiency and effectiveness in order to strengthen the alignment of individual processes with the overall strategy of the company. While the optimization of a singular process or of the processes in a particular business function could trigger real business improvement, organizations that gather their efforts across the entire organization can see significant competitive advantage, better customer service (internal and external), and much more efficient operation.

2 Business processes’ optimization approaches

Zhou and Chen [1] suggest that business process optimization should aim at reducing lead time and cost, improving quality of product and services, and enhancing the satisfaction of customer and personnel so that the competitive advantage of an organization can be maintained. Reijers [2] suggests that the goals of business process optimization are often the reduction of cost and flow time. However, Hofacker and Vetschera [3] underline that the concept of “optimality” of process designs is not trivial, and the quality of processes is defined by many, often conflicting criteria.

Zhou and Chen [4] remark that there is still no structured optimization methodology or technique for business processes. Optimization is not an option for diagrammatic process models. This is because optimization requires quantitative measures of process performance that cannot be offered by diagrammatic models. However, there are many qualitative improvement approaches applied to diagrammatic process models such as that by Zakarian [5] and Phalp and Shepperd [6]

to name a few. **Table 1** summarizes the main business process optimization approaches identified in literature, mostly related to Petri nets and mathematical process models. Taking into consideration the emphasis that has been put on Petri nets for their analysis capabilities, one would expect that they would also fit for optimization purposes.

But, according to Lee [40], Petri nets are not appropriate to solve optimization problems except using graph reduction techniques. Although they can capture system dynamics and physical constraints, they are not suitable for optimization problems with combinatorial characteristics and complex precedence relations.

Table 1:

MODEL of business process	modelling SET(S)	TYPES of business process optimisation	APPROACHES to business process optimisation
-Petri-nets (and workflows)	-Diagrammatic models -Mathematical/formal models	-Graph reduction techniques	- (Sadiq and Orłowska, 2000) - (van der Aalst <i>et al.</i> , 2002) - (Lin <i>et al.</i> , 2002)
-Mathematical models	-Mathematical/formal models	-Algorithmic approaches	- (Han, 2003) - (Gutjahr <i>et al.</i> , 2000) - (Jaeger <i>et al.</i> , 1995) - (Hofacker and Vetschera, 2001) - (Soliman, 1998) - (Tiwari <i>et al.</i> , 2006) - (Vergidis <i>et al.</i> , 2006) - (Volkner and Werners, 2000) - (Zhou and Chen, 2003a) - (Zhou and Chen, 2002) - (Zhou and Chen, 2003b)
		-Activity/Task consolidation	- (Dewan <i>et al.</i> , 1998) - (Rummel <i>et al.</i> , 2005)

Zhou and Chen [1] developed a structured design methodology for business process optimization from strategic, tactical, and operational perspectives using quantitative methods that support the design. This optimization optimally assigns resource capabilities, organizational responsibilities and authorities, and organizational decision structure. Another approach to optimization is the consolidation of the activities (or tasks) of a business process. Rummel [9] proposes a model that focuses on decreasing the cycle time of an internal process by consolidating activities—assigning multiple activities to one actor—thereby eliminating the coordination and handoff delay between different activities that occurred when assigned to different actors. As this approach is activity focused, it ignores interactivity delay that may contribute significantly to overall process cycle time. Dewan [10] claims that there is no

structured methodology to determine the optimal re-bundling of information-intensive tasks. They present an approach to optimally consolidate tasks in order to reduce the overall process cycle time. The authors present a mathematical model to optimally redesign complex process networks but a limitation of the paper is that it refers to business processes with information flows only. Its main contribution is the effective business process restructuring and the reduction of the overall task time using handoff delay reduction or elimination as a result of a unified methodology applicable to multiple task-based business processes. Although formal languages have associated analysis techniques that can be used for investigating properties of processes, an optimization approach based on executable process languages was not observed in the literature. Since most of the optimization approaches—as discussed before—are based on algorithmic methods, these could be easily translated to executable software

programs. Analysis and optimization of business processes can be done best using an approach based on explicit and executable process models. Such models would allow evaluating performance in terms of flows, calculating costs against objectives, recognizing constraints, and evaluating the impact of internal and external events. Therefore, by being able to assess the process execution quality and costs, it is possible to take actions to improve and optimize process execution.

3 Key factors in financial and operational optimizations

There are various warning factors that signal the degradation of business processes. These factors are triggered either from the internal or external environment of the business. The signals are usually presented before the company enters into a crisis. There are cases where managers do not observe these signals or consider them to be some one-off or periodic difficulties. This approach does not only aggravate the outcome of the business, but, on a long term, threaten the existence of the organization itself [7]. Most companies agree to implement a change management plan. The overall review of the process can be split into five stages, as follows [8]:

- Stage 1: Analysis, usually takes from one week to one month.
- Stage 2: Planning – takes from one to three months.
- Stage 3: Implementation - six months to one or more than one year.
- Stage 4: Monitoring - six months to one year.
- Step 5: Return to business growth - from one year to two years.

3.1 Corporate approvals for business optimizations

The preparation of an effective restructuring plan (Slatter, Lovett, Barlow, 2006) is based on the following elements: crisis ending and business stabilization, appointment of a new

director, stakeholders' management, strategic orientation, critical improvement process, implementation of organizational changes and financial optimization.

Six major milestones must be attended by an organization: (according to Downey, 2009):

Step 1: Changes in the management structure. It refers to bringing a new CEO or an external specialist. Involves the board of directors or senior management to recognize that a change is required and initiate a corporate review program.

Stage 2: Business Review. Rapid identification of the problems faced by society and assessment of business survival chances: strategy, operations, finance, infrastructure, people, commitment and ability to change.

Stage 3: Business Restructuring Plan. Establishing appropriate strategies and a well-structured recovery plan to deliver lasting results.

Stage 4: Implementation. Organizations can use sharp actions to save the company's performance: layoffs, department dismantling, and drastic cuts in all nonessential costs. Positive cash flow is critical and needs to be set quickly. In addition, the cash will be needed to implement the review strategy and must come in a timely fashion.

Stage 5: Stabilization. In this stage, the main aim is to increase the efficiency and the effectiveness of the business operations the focus is on. It is necessary to improve the profitability, but also to ensure the good functioning of the existing technologies.

Stage 6: Implement the change(s). The final stage is to implement the planned change, the organization / corporation restoring its financial loneliness. At this stage motivates staff and employees to achieve profitability and return on investment.

3.2 General corporate model for business restructuring through optimizations

Strategic analysis, monitoring, and strategic planning of the organization's/ corporations' activities can be monitored and controlled on the basis of several methods, models and

process diagrams. One such method is the **Critical Success Factors** method provided by Rockart (1979), which is based on the 80/20 Pareto rule for strategic management needs. The method involves identifying the critical success factors of the company as the results in important areas to ensure corporate success. This method identifies the most important business processes and the performance indicators (or KPIs) of these processes. It allows the plan to be compared with the results obtained, as well. The effectiveness of strategy implementation should be measured continuously in order to ensure continuous improvements of the operations. Key areas of corporate restructuring include: sales, finance, production and supply chain, management activities, services, business development, organization and human resources. Supply and logistics are usually embedded under the production processes or activities.

4. Managing Processes versus Projects

One important aspect is to make the difference between processes and the projects. Business processes consist of providing value to a customer through value-added activities, moving work across functional area boundaries, and controlling process performance indicators and standards and measuring process execution. Business processes are usually driven by facts or events, such as the maintenance of a factory, printing a product catalogue, the close of a billing cycle, or solving customers' issues in reconciling a checking account. These are activities that are typically replicated and repeated with specific resources allocated to an individual steering group such as factory line workers or customer service employees, to give some examples. Business processes are looking to the following core features: efficiency, agility and meeting customers' demands. While efficiency seeks to cut operational

costs and cost of capital, agility strives to cut the time required to develop products and services, and to respond to customer and market demands (thus through improving the effectiveness). Customer demands focuses on retaining the customers and their overall level of satisfaction.

A project, as defined by the Guide to the Project Management Body of Knowledge (PMI, 2004) is represented by a series of activities, and related tasks with a dedicated objective, bounded under a starting and an end date, and resources. A project consumes cash, people, time and equipment for the specified time period and defines what is planning to be done, when to do it, and ensures that the planned results are reached. The tasks of a project are unique and usually not repeated, and once the project is planned, changes to the plan are avoided to ensure meeting the schedule. While business processes look for efficiency, agility (effectiveness), and meeting customer demands, projects look to deliver the related objectives within established budget and time boundaries.

Thus, a processes optimization project is a short to medium term effort an organization puts upon to identify all necessary inefficiencies/ redundancies, decide the action plans to resolve them and ensure the optimization enhancements will meet the desired results without any negative outcome for the current operations.

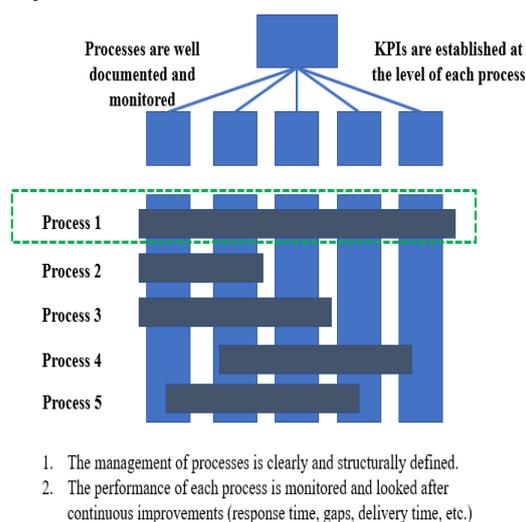
4.1 Keys to Optimizing Processes

The executive management have to be equipped with the necessary tools to make the right decisions to realize the organizational course corrections with agility. The keys to optimizing process performance and execution capability are tied to the organizations' commitment to define and continuously assess and update the documentation of internal business processes. These documentations, including process maps, inputs and outputs, resource allocations, cycle times, etc., formally define the scope of the process from initiation to delivery and serve as the "process

roadmap”.

Once the decisions are made, the Business Process Optimization (“BPO”) projects concentrate the organization to identify and scrutinize opportunities to reduce costs, eliminate waste and reduce cycle times, while increasing products and services quality. There are cases when the vast majority of organizations continue to operate in silos. This is where the core business processes’ activities must cross the traditional functional view and have neither an owner assigned nor measures of process execution success. Many successful organizations have mature business process management structures where the core and support business processes are well-defined, documented and assigned to an owner, measured for execution success, and scrutinized for efficiency, agility, and quality. Process management focuses on the management of the cross functional processes. This involves continuous monitoring, evaluation and measurement in terms of costs, quality, cycle time, etc. (Figure 1 below).

Fig. 1



Formally defined processes and related documentation bring an organization with visualization of high-level and detailed core, supporting and management processes. Processes maps and supporting detail documents define how the

processes look like, their interactions across business functions, what each the process step delivers and how it produces its intended deliverables. Process owners own the core or supporting business process, not the individuals assigned to work the tasks within the process. The process owner is responsible to ensure that the execution of the process is successful and that it works to identify process issues, root causes and training needs. In order to manage a process that will bring continuous successful execution, process communications must ensure that process the information flow is established vertically and horizontally across the organization. A process owner must be able to monitor the external and internal flows of information. The purpose of process communication is to make sure that all employees are informed of process performance information and to control the company's progress toward its objectives and goals.

4.2 The Efficiency should never compromise the Quality

For many consumers, the quality of the products and services is as important, if not more important than the cost of the product or service. While the focus of many business process optimization projects is centered on optimizing efficiencies and reducing the cycle times, businesses must continue to ensure that the business process optimizations does not compromise the quality of the product or services that are delivered by the internal processes. Six-Sigma methodologies are usually used to embed quality into process optimization projects. Six Sigma originated at Motorola in the early 1980's and is a methodology for disciplined issues solving and quality improvement. Six Sigma's goal is the near elimination of defects from any process, product, or service, limiting defects to just 3,4 defects per million opportunities. To ensure organizational alignment, Six Sigma methodology requires all improvement projects must be integrated with the goals of an organization. The DMAIC methodology

Six-Sigma (The Black Belt Memory Jogger, 2002) employs the following activities:

- Define: the phase whereby the customer needs are established and the processes and products to be improved are identified.
- Measure – determine the baseline and target performance of the process, defines input and output variables of process steps, and validates the measurement methods.
- Analyze – analysis of data to identify critical factors required for process execution.
- Improve – identification of necessary improvements/ optimizations (process, procedural, systemic, etc.) to optimize the outputs and eliminate and or reduce defects and variation. Statistically validates the new process operating conditions.
- Control – establishes the development of documents, monitors, and assigns overall responsibility for sustaining gains made by the implementation of process improvements.

5 BPO Project Management Methodology

Business Process Optimization projects follow the same method as defined by the Project Management Institute. Project management is obtained through the use of the process group such as: initiating, planning, executing, controlling, and closing. As stated in the Project Management Institute's Guide to the Project Management Body of Knowledge 2000 edition, “these process groups are linked by the results they produce- the result of one often becomes an input to another.” Specifically:

- Initiating- approving the project or phase is part of the scope management;
- Planning- defining and refining objectives and selecting the best of the alternative courses of actions to reach the objectives that the project

was undertaken to address.

- Executing- coordinating people and other resources to carry out the plan.
- Controlling- ensuring that the project objectives are met by monitoring and measuring the KPIs periodically to identify variances from plan to identify corrective actions that can be taken, when necessary.
- Closing- formalizing acceptance of the project and bringing it to an orderly end.

5.1 Combining Six Sigma and Project Management Best Practices in the Initiating and Planning Process Groups

One of the single, most critical activities to ensure the success of a project, whether it be in the development of a software application, drug compound or optimizing a key business process, is the clear and concise definition of project objectives, goals and milestones in the projects planning phase. The purpose of the project should support the vision and mission statements of the organization and it requires the support and commitment of the management. Business process optimization projects should contain a section in its charter that defines the specific business process to improve. This formalized definition of the process optimization scope eliminates any confusion and formally defines the subject boundaries. Additionally, it assists in the identification of the established deliverables. For example, a fulfillment organization receives customer complaints on low order fill level. The customer places an order for a quantity of 100 for a particular item and receives only a quantity of 90. The project objective could be “to optimize the warehouse picking process to ensure an increase in the fill rate on customer orders from 90% to 99% by 4th Quarter 202X”. The process scope has been narrowed specifically to the picking process and provides the basis for the process goal.

Six Sigma is a data driven problem solving methodology that requires the formal definition of performance key indicators. When planning for a process optimization

project, specific Six-Sigma tools and activities are used to characterize customer needs, and processes to be improved. These tools include the mapping of the high-level process in its current state, identification of the processes existing performance measures (i.e., pick time, product staging time) and a process financial analysis (i.e., resource cost, overhead). Specifically, Six-Sigma seeks to identify the Costs of Poor Quality (COPQ). COPQ includes costs of repairs, rework, rejections, inspection, testing and in the case of our fulfillment example, the cost of customer complaints. While a process optimization project's benefit can be measured financially (hard) or non-financially (soft) most business cases are based on the hard benefits. In the above example, the soft benefits of "improved customer satisfaction" should be considered as well.

While discussion of the "customers", Six-Sigma projects take the time to understand the needs of the customers. The project team must understand how the process issues link to the eventual customers. Six-Sigma mentions about the "voice of the clients" research to gain this important insight. There are many different methods to researching the customer's voice. These include, but are not limited to the following:

- Customer Complaint database- this is an acceptable place to start if the organization formally tracks issues;
- Direct Contact- if allowed, considers phone call surveys, focus groups, interviews at the point of provision.
- In-Direct Contact- includes mail surveys, feedback cards, market research and competitor analysis.
- Becoming the customer- order from your own distribution center, buy your own brand products, set up a new account with your own financial institution.

Another effective tool to use in a process optimization project is the SIPOC High Level Process Mapping tool. The

acronym SIPOC stands for Suppliers, Inputs, Process, Outputs, Customer. It is a simple, but effective tool to align the project team and all stakeholders as to the core process within the scope of the project. It is important to mention that it is too early in the project to mention the existing process (that comes later in the Measure Phase).

The general approach to the SIPOC process identification includes the following steps:

- Begin with a simple definition of the in-scope process;
- Identify key steps of the process (expand these at the bottom of the SIPOC diagram);
- Have the project team identify the major inputs and outputs of the process;
- Have the team identify key suppliers of the inputs, and customer for each output.

Accordingly to any other project, a business process optimization project requires the formal identification of a project team with clear structure, roles and responsibilities. It can be used the SIPOC High Level Process Map to ensure all process stakeholders are represented on the main project team.

The Initiating and Planning Phase of a business process optimization project starts by formally identifying the process problem, not with the identification of the solutions to the problems/ issues. Six-Sigma tools such as the SIPOC, COPQ, and VOC help the project team identify the potential issues, process scope and essential process representatives, before the organization invests substantial time and money in the initiatives.

5.2 Measuring and Analyzing Current Process Performance

During the execution phase of a BPO project, the project manager is concentrated on executing the process optimization plan. These integral activities include the development of individual and team skills through the use of various team building exercises, reward and recognition systems and locating team member in the same physical area. The project manager is also focusing efforts to ensure the process

optimization plan is being carried out through regularly scheduled status meetings to exchange information about the specific project. During the execution phase, team efforts are focused in the identification of measurements to determine the effectiveness and efficiency of the process. There is necessary to develop the process measures which are critical for the process optimization project. It must identify and capture data on key performance indicators to determine process effectiveness and efficiency. Process effectiveness measures a customer's quantifiable service or product specifications. In addition, a process optimization project must track key performance indicators that reflect the internal efficiency of the process. In general, the following main steps are completed to measure the performance of a business process:

- Develop a data collection plan for the process;
- Identify process efficiency data collection sources;
- Identify process effectiveness data collection sources;
- Collect efficiency and effectiveness data to determine process performance baseline measurements.

5.3 Controlling Key Business Process

Following the development and testing of systemic, procedural, or responsibility enhancements, the BPO project team efforts should focus on ensuring the solutions are implemented and measured for their effectiveness. The project team must identify measures to be monitored after the desired state process is landed. This activity includes the identification of the persons responsible for collecting and analyzing the process data and reporting process efficiencies and effectiveness to the entire organization in the form of dashboards or status reports. Six-Sigma projects typically employ Statistical Process Control charts that monitor the

stability and variation of a particular process. A typical Statistical Process Control chart tracks the performance of a process over time and shows control boundaries which the results will lie between if the process is "in-control". Use of any Statistical Process Control charts require regular updating and review to ensure their feasibility. This ensures that process performance doesn't decline again.

Process change control is another key that ensures ongoing alignment with an organization's strategic goals. Processes are enabled by technological change, not hindered and that the appropriate organizational structure is in place to provide resources to support the business process. As documented in the Six Sigma Black Belt Guide (2001), a classical model for managing the change process has three phases: (1) unfreezing, (2) movement and (3) refreezing. Once a process change is identified and ready for deployment, the "unfreezing" of existing behavior patterns must be addressed. Typically, most work groups are resistant to changes and this must be solved. People or practices must then be moved (movement) to the process change by training or through technology adoption. Once, process resources have acquired the necessary skills and technology is in place, the process is then *refrozen* to ensure the process or function is aligned for organizational effectiveness. One effective technique used to facilitate the transition from existing processes to the new process is the use of a formal "White Paper Fair" where all functional areas impacted by the process changes have an opportunity to visualize the process enhancements.

6. Implementation of optimization processes- market study results.

Through a questionnaire developed according to the basic conceptual model of the project optimization implementation, process includes the following major specific modules, namely:

- Changes in business processes;

- Optimizations targets (planned and achieved);
- Optimizations implementation issues;
- Obtained benefits;
- Impact of the optimizations on corporate performance;
- Success factors of the optimizations.

The market study run over Romanian market (mostly energy sector) shows which are the main items of the above modules impacted by the optimizations.

6.1 Changes in business processes

The study shows that on average product design/ development, costs reductions aims, inventory management and production planning have led to a change in business processes to the largest extent. The sales and ordering, product design/ development, distribution, inventory management and production planning have determined the change in business processes measure.

On average, at the level of the study, only advertising/ promotion, billing/ payments and business planning received less attention.

6.2 Optimizations targets (planned and achieved)

The study shows that, as far as the objectives were included in the optimization plans, on average, at Romania level, the improvements based on automation, reduction of the costs and production costs, increase of competitiveness through costs reductions and the utilization of the novel technologies represented the main goals for which the objectives and targets were included in project plans. On the other hand, the increase in competitiveness through increased quality, concentration on the main results and the establishment of aggressive objectives received the lowest scores with regards to the optimization targets.

6.3 Optimizations implementation issues

The study shows that, having in mind the main implementation issues list at the planning level, on average, at the level of Romania, the available IT infrastructure does not support the planned optimizations, management reticence to allocate the funds and the business mistakes under the pressure of delivering the expected results were have been the major issues for the implementation of the optimizations.

6.4 Obtained benefits

The list of possible issues considered to be under the list of benefits of the optimizations' implementation found at the company level, as resulted from the market study, at the level of Romania, shows that the customer satisfaction level (improved response to clients' requests), concentrating the resources towards the selling aspects, increased flexibility through the adoption of new IT technologies and more efficient marketing and selling processes were the major benefits of the optimizations' implementation.

6.5 Impact of the optimizations on corporate performance

Based on the market study performed, the main items that were considered to be of impact of optimizations' implementation found at the company level, in Romania, shows that in terms of impact on corporate performance, on average, improving the development of new products, improving the costs' reductions and improving the investments return level, had a greater impact on corporate performance. On the other hand, the improvement of the sales rate, increasing the market rate and the improvement of the operational profits had the lowest impacts on corporate performance.

6.6 Success factors of the optimizations.

Based on the market study, the list of possible matters considered to be success factors at the optimizations level, found at the company level, show that the utilization of experts or external support, optimizations

driven by customer requirements and competitive pressures and involving all important employees represented to a greater extent impact on success in optimizations' implementation. On the other hand, the process mapping approach, the development of a well-defined project structure and using the internal surveys scored the lowest in terms of the main success factors for the optimizations done.

6.7 Summary of the study

The approach to optimizations is a broad one and aims at a sharp change in the quality of services offered, costs and production, including the analyses of the current state of scientific research in this field, based on the most recent and representative references in the relevant literature and interpretations and own contributions. This study aimed to provide certain contributions in the BPO environment, namely:

- to highlight factors and conditions necessary for the optimizations of financial and business companies;
- establish the optimization methodologies, but also how to apply them;
- Identify the common traits of business optimizations and/ or related methodologies, along with the actions and measures used;
- Developing a general optimizations model for companies, through which managers will be able to determine the reasons for the changes they want, as well as changes in the environment, all of which stimulate the need for improvements.

The results conclude that organizations do not focus on some of the most important tasks and actions recommended in the literature as a basis for optimizations, such as the use of time as a competitive advantage, changes in customer/ market business/ processes, the value-added item of each business activity and the application of the right

innovative technology. Therefore, one can assume that there is a major reason why many of the optimizations project objectives were only modestly achieved.

On average, the most common problems encountered in optimizations' implementation appear to be basic and difficult to solve in practice: implementation difficulties due to communication barriers between the organization/ functional sub-units, unexpected amount of optimization efforts required, interruption of operations, failure to achieve the expected benefits, pressure business mistakes to produce quick and overestimated results, and reluctance of top managers to commit the funds needed for the project.

Given that most optimizations benefit from innovative uses of information technology, an organizational problem that could condemn optimization projects to the failure of a particular company is the lack of communication between CEOs / top executives and CIO / IS managers.

7. Conclusions

Organizations can achieve sustainable and effective process improvement by combining project management best practices with certain Six Sigma methodologies and automation solutions. The ability to combine these proven methodologies provides the structure and discipline required to identify process improvement and optimization opportunities, develop sustainable solutions and lead the organization through the strategic change process. Use of these integrated techniques allows business processes to be efficient, agile, and meet the organization's customer demands. In today's challenging, global economy it is essential for organizations to combine the disciplines of Project Management, Six-Sigma and business process optimization to realize process gains that ensure "faster", "better", "cheaper" for their products or services, while maintaining a high level of quality in the marketplace.

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