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## Optimizing Project Success through Pragmatic Process Improvement Initiatives

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### **Abstract:**

*A major challenge in the rich history of project management had been the lack of consensus on the nature and definition of project success that considered the disparate interests of all stakeholders, over time (Cleland & Ireland, 2007; Kloppenborg & Opfer, 2002; Moris, 1994; Sauer, Gemino, & Reich, 2007; Bannerman, 2008). In order to overcome this age-long hiccup, project success has been defined in this work in a holistic manner that appeals to the vested interest of stakeholders across the board, in a timeless way. This approach was based on Bannerman's (2008) Multi-Level Framework for project success definition. The framework defines project success as one measured by five key success metrics, namely, project management, process management, product management, business management, and strategic management. The objective is to take care of the interests of the stakeholders across the board, including, project managers and their teams, end users of products or services delivered, the organization with its immediate investment goals, as well as, the society with its longer term developmental needs. Of all five levels listed above, process management underlies the rest, and forms a fulcrum around which they revolve and depend on. Hence, a successful process improvement initiative will likely impact positively on the rest four key result areas, all things being equal.*

*Basically, both literature and research affirm that a significant positive relationship exists between project success optimization and process improvement (Bakotic & Kirnic, 2017). Given this scenario, a proper implementation of pragmatic process improvement methodologies, will most likely enhance the chances of optimizing project success. This is the key thesis of this seminar. Of which, the main objective is to expose project managers and their organizations to pragmatic Business Process Improvement (BPI) methodologies that can lead to optimized process project success (and hence, optimized project success) in the present industrial dispensation. This seminar became necessary given that the findings of research have shown that lack of knowledge about pragmatic tools (like Lean Six Sigma System) has been among the greatest obstacles to their adaptation and implementation, especially, among SMEs (Anthony & Kumar, 2014).*

*Whereas, many BPI methodologies have existed over the years, most of them have faded away in the course of time. However, Lean Manufacturing and Six Sigma methodologies, due to their relevance to the present times, have been acknowledged among the pragmatic tools that have stood the test of time, in offering solutions to most process improvement issues in both production and service industries of all sizes and disciplines. Furthermore, an integration of both tools has been especially affirmed by empirical literature, to yield added advantages than derived from either of them separately (Anthony & Kumar, 2014). Therefore, Lean Six Sigma Systems is hereby recommended to project managers and organizations who are on a quest for pragmatic initiatives that optimize process success for an optimized project success, provided that factors enhancing process project success are maximized, and those that lead to process project failure are minimized (Rever, 2008).*

**Keywords:** Project, Project Management, Process, Business Process Management, Business Process Improvement, Project Success, Process Improvement Project, Project Success Optimization

### **1. Introduction**

A key challenge in the rich history of project management had been the lack of consensus on the nature and definition of project success that took into consideration, the disparate interests of all stakeholders, over time (Cleland & Ireland, 2007; Kloppenborg & Opfer, 2002; Moris, 1994; Sauer, Gemino, & Reich, 2007; Bannerman, 2008). Traditional literatures have variously defined project success in terms of ability to meet with time, budgetary and quality prescriptions, or the ability to achieve the business objectives which the project is designed to pursue. Hence, two major reasons emerge for the lack of consensus (Bannerman, 2008): (1) Researchers tend to use diverse kinds of definitions. (2) The term "success" is relative, and its meaning is dependent upon the perspectives (otherwise, the vested interest) of stakeholder/s. This has led to a lack of a common measure of success or failure. Besides, the passage of time makes a difference in terms of the impression about how successful a project is, after project close-out: what is deemed success today, may or may not make pass for such in the near or distant future.

In order to help foster a consensus, to proffer an interesting definition of project success that resolves the foregoing dilemma, Bannerman's (2008) Multi-Level Framework has proposed an interesting model for measuring project

success, such that considers the interest of stakeholders across the board, multiple disciplines and time frames. The author argues that any realistic definition of project success needs a holistic measurement approach. It must put the perspectives of all stakeholders across the board into consideration. It must also bear in mind that project management is not necessarily an end in itself, but a means to an end (a kind of utilitarian, investment or visionary end). Such a concessionary definition, according to Bannerman (2008), therefore, should embrace five (5) success components, namely, (1) Project Management Success (in terms of time, cost and quality); (2) Product Success; (3) Business Success; (4) Strategic Success; and (5) Process Success.

Accordingly therefore, Bannerman (2008) postulates that a universal definition of Product Success goes beyond project management success as an end to itself, to measuring the extent to which the end product of the project management, benefits the end user/s; the Business Success looks at how far the project itself satisfies the organization's business investment objectives (in terms of ROI); the Strategic Success looks beyond the immediate results in terms of product success and organizational goals, to the wider, visionary developmental needs of the larger society; whereas, Process Success deals with the process or process groups along the project phases and life-cycle. Simply put, according to the author, a universally acceptable definition of project success may be said to be success that occurs in all five key performance areas of a project, that is, project management, process management, product management, business management, and strategic management. Such a definition will not only holistically embrace stakeholder perspectives across the board, but also, stand the test of time.

Of all the above five components of project success, Process Success seems to underlie the rest, and provides a kind of fulcrum around which they revolve, to produce the overall project success. Business processes are fundamental to every organization's performance and ability to successfully execute its project managements, products, business or even strategic visions. Technology can help, the right people are important and proper supportive organizational structures are necessary. However, processes are key mechanism by which businesses deliver value to their customers. Therefore, the implementation of a pragmatic process improvement initiative, would likely help to optimize (maximize) the overall project success. Bearing this in mind, the main objective of this seminar is to explore available literatures and researches on project success and process management/improvement methodologies, in order to suggest dynamic process improvement initiatives that can help project managers to optimize project success. This seminar became necessary given that the findings of research reveal that lack of knowledge about pragmatic process improvement tools (like Lean Six Sigma system) has been among the greatest obstacles to their adaptation and implementation, especially, among SMEs (Anthony & Kumar, 2014).

In order to pursue this goal, this presentation covers the following areas within the available space: The principles and Practice of Project and Project Management; The Principles and Practice of Business Process Management and Improvement; and, Pragmatic Process Improvement Initiatives. We shall conclude with recommendations for optimizing project success via selective, pragmatic process improvement initiatives.

## 2. The Principles and Practice of Project and Project Management

### 2.1. Defining a Project

There are many definitions of what constitutes a project, some of which describe the nature of a project, and how it differs from other types of work. The Project Management Institute's (PMI) *A Guide to the Project Management Body of Knowledge (PMBOK® Guide)* Third Edition, defines a project as "a temporary endeavor undertaken to create a unique product, service, or result" (Project Management Institute, 2004). A project therefore is a temporary process, which has a clearly defined start and end time; a set of tasks and a budget that is developed to accomplish a well-defined goal or an objective. The elements included above are basic with most definitions found in the literature. Among the definitions, one can deduce that there are some reoccurring specific attributes that describe a project and separate it from most ordinary work, such as the following:

- A project has a beginning and an end.
- A project has limited resources.

### 2.2. What then is Project Management?

According to PMI (2019), "Project management is the application of knowledge, skills, tools, and techniques to a broad range of activities in order to meet the requirements of a particular project." In other words, the institute says that project management is "the planning, implementing, and monitoring of project activities to meet project objectives, achieved by effectively controlling and balancing the constraint of time, cost, and scope in producing quality deliverables that meet or exceed the expectations of the project stakeholders." Furthermore, PMI (2019) describes project management as the "discipline of planning, organizing, and managing resources to deliver all the work required to complete a project within defined scope, time, and cost constraints." Again, PMI (2019) avers that the temporary nature of projects, contrasts them with regular operations, which are permanent or semi-permanent ongoing functional works that create the same product or service over-and-over again.

### 2.3. The Evolution of Project Management

Project management as a formal practice is a recent development, although its principles have been in existence early on in human existence. According to Haughey (2019), project management in the modern sense began in the 1950s though it has its roots further back in the latter years of the 19<sup>th</sup> century. The author reports that the need for project

management was driven by businesses that realized that there are benefits in organizing works around projects, as well as, the critical need to communicate and coordinate work across departments and professions. Herein is the essence of the organizational structure - to harness people, resources and tasks to achieve the common objectives. The author further reports that one of the founding fathers of project management is Henry Gantt (1861-1919), the creator of Gantt chart which is still in use. He adds that "In the mid 20<sup>th</sup> century, PERT charts emerged as complex diagrams that show the critical path of a project." The above tools, says Haughey (2019), spread quickly as businesses looked for new ways to manage large and complex activities, evolving into project management as we know it today. Finally, the author concludes that it is now over sixty years since the birth of project management, and that much of the early work has now been put together into formal methodologies as we have them presently; and, despite the fact that many methodologies exist, they all work with the same basic principles and good practice. Notable milestones have been achieved in the evolution of project management leading to the delineation of standardized process groups that are applicable to any project type, stage and life-cycle.

#### *2.4. Understanding the Stages and Processes of a Typical Project*

##### 2.4.1. First, what is Project Life-Cycle?

Project life-cycle refers to the stages and phases of a typical project. Much has been documented in diverse literatures concerning the life-cycle of a project. The project life cycle is generally defined as a workflow of activities organized in systematic ways to realize optimal benefits from business project. A typical project is marked out by its life-cycle, which usually consists of phases and process groups.

##### *2.5. Why does the Observation of a Project Life-Cycle Matter?*

A number of benefits accrue when the project manager observes the project phases applicable to his field. According to the PMI, the project life cycle is critical for managers who desire to deliver projects to clients successfully. For instance, it helps to design goals and objects appropriately, to give a clear picture to promoters and stakeholders, to help project managers in balancing project quality, scope, cost and resources. Overall, following the life-cycle would promote successful process management/improvement, and hence, project success. Simply put, observing the project life-cycle helps process improvement initiatives to be more focused, efficient and more successful, by enabling process definition, measurement, analysis, improvement, control, and monitoring.

The number of project phases and their designation varies from one application, application area, and even from one author to another. The project cycle is commonly described in the literatures as having between 4 to 6 stages and phases, depending on the author's perspective. For the PMI, the 4 project phases are: Phase 1: The Conceptualization Phase – this is the equivalent of project initiation (involves: Creation of the statement of work (SOW); Presenting the business case; and Creation of a business contract). Phase 2: The Planning Phase (Determining resource availability; creating a project budget; and beginning to allocate tasks to certain resources). Phase 3: The Execution Phase (Strategic planning; and Implementation planning). Phase 4: The Termination Phase (The disbandment of the project team; Personnel and tools are reassigned to new duties; Resources released back to parent organization; and Project transferred to intended users).

Other experts proffered project cycle models that involved up to 6 stages: again, it is all a matter of where the author is coming from. But, generally, the workflow of activities as given by the literatures generally follows the same essence of creating an essential guide to the project manager in project integration management. Haughey's (2019) work titled, "21 Ways to Excel at Project Management", which describes a 6-stage project cycle, is pretty comprehensive, and yet, it concisely captures all activities included in the standard models. It will probably be helpful to most project managers irrespective of their field of operation. The author incorporated practical guidelines which are somewhat akin to the tips found in several other literatures, including major ones like PBOK. Hence, it has been used below to deal with project process groups.

#### *2.6. Six Project Process Groups*

Here are the six stages of a typical project according to Haughey (2019):

##### 2.6.1. Project Definition Process

This is usually the first few weeks of the project when the project team begins to work on the definition document. At this stage, which precedes initiation, the project manager ensures that the project sponsorship, Steering Committee, goals, objectives, scope, coordination, risk issues, budgets, project manager, customer representation, Roles and Responsibilities, the right resources, and time scale approaches, have been defined and communicated to the stakeholders to get agreement. Any differences of opinion at this point, must be settled before work begins.

##### 2.6.2. Project Initiation Process

The project initiation stage is seen as probably the most important stage of any project as it sets the terms of reference within which the project will be run. According to Haughey (2019), failing to carry out the initiation properly will result to a high likelihood of failure. Why? Because this is the stage where the business case is declared, scope of the project decided and stakeholders' expectations set. It should be noted that the time spent on planning, refining the

business case and communicating the expected benefits will help increase the likelihood of success. It is often tempting to start execution quickly, but a poor initiation will lead to problems and failure.

#### 2.6.3. Planning Stage Process

Issues to be considered at the planning stage include the following: project size, project budget, project risks, prototyping, test plan, and detailed implementation plan. According to Haughey (2019), planning is critical to a successful project. Therefore, the author contends that creating a project plan is the next thing to do after project has been fully designed. But he laments that incidentally, planning is often, either done hurriedly or ignored in favor of going on with the work, but that, where it is properly done, it saves time, money and a lot of other challenges. Hence, a detailed project plan should be developed and signed off by the Steering Committee.

#### 2.6.4. Project Execution Process

This is the stage where the work is now done to deliver the product, service or wanted result; it is at this stage that most of the work related to the project is realized, hence, it needs a complete attention from the project manager. It is therefore imperative to create an implementation plan. The implementation will benefit much if treated as a separate project (Haughey, 2019).

#### 2.6.6. Monitoring, Controlling and Reporting Process

Once the project has been set rolling, the project manager should keep control, and this is ensured by regular monitoring, conducting tests, control and reporting of issues, risks, progress and continuous checking of the business case, as to ascertain that the expected benefits will be realized, and remain valid. According to Haughey (2019), it is ideal that the project be monitored and controlled on weekly basis. This entails holding Status Update meetings, as discussed later in this work. Haughey (2019) observes that the need for monitoring is accentuated by the fact that tasks are often underestimated and many new tasks will be identified as the project moves on.

#### 2.6.7. Project Closure Process

Except a project is closed, it will continue to consume resources. It is therefore, important to ensure that a project is closed properly. According to Haughey (2019), a proper project closure entails a number of activities, including the following:

- A formal signoff during which you get the customer's agreement that a project has ended and no more work will be carried out.
- A post implementation review: This is a tool for recording the good and bad points, so that successes can be repeated and failures avoided. At the conclusion of any project, the project manager should hold formal debrief sessions, which includes a post implementation 'Lessons Learned' review with the team.
- Learning the lessons: Every project has the potential to help you run future projects more effectively. After assessing the project whether it was a great success, total failure or anywhere between, you need to concentrate on the big, important lessons from the project, the ones that will have a big impact on your future projects.
- Realizing the project benefits: Disbanding the team soon after delivery can result in the solution withering away and dying over time, especially if it has fallen on stony ground. This is especially necessary for a project that involves a change in working practices, or revised business processes. According to Haughey (2019), "A project should only be considered completed when the benefits have been delivered to the business and not when the project has just been delivered. This will ensure that implementation problems are resolved. To gain benefits you must have change."
- Celebrating success: Haughey (2019) counsels that before moving on to your next project it is worth spending some time to celebrate your success. It provides a way to say 'thank you' to your team and helps with motivation. Always publicize your successes both internally and externally. This will help raise you and your teams profile and credentials for future projects.

Practical guidelines drawn from various literatures have been explored which to arm the project managers with step by step tips for process success in their project integration management (see on Annex 1).

### **3. The Principles and Practice of Business Process Management and Improvement**

#### *3.1. Definition*

Many definitions of business process management (bpm) exist in the literatures, most of which, are in agreement that the key goal of bpm in organizations is to achieve continuous improvement. Bpm institute (2000) defined business process management as "the definition, improvement, and management of a firm's end-to-end enterprise business processes in order to achieve three outcomes crucial to a performance-based, customer-driven firm: 1) clarity on strategic direction, 2) alignment of the firm's resources, and 3) increased discipline in daily operations." According to the complete business process handbook, the workflow management coalition, and several other sources, use the following definition, "business process management (bpm) is a discipline involving any combination of modeling, automation, execution, control, measurement and optimization of business activity flows, in support of enterprise goals, spanning systems, employees, customers and partners within and beyond the enterprise boundaries." The association of business process management professionals (abpmp) defines bpm as: "a disciplined approach to identify, design, execute, document,

measure, monitor, and control both automated and non-automated business processes to achieve consistent, targeted results aligned with an organization's strategic goals."

Going by the above definitions, bpm involves the intentional, collaborative and continuous technology-aided definition, measurement, analysis, improvement, and control of business processes to create value and reduce wastes in order to enable an organization meet its business objectives with more and more flexibility. In line with this view, abpmp affirms that the essence of bpm is to enable "an enterprise to align its business processes to its business strategy, leading to effective overall company performance through improvements of specific work activities either within a specific department, across the enterprise, or between organizations." Basically, processes are therefore, important to organizations, and they must be understood, managed, and developed using bpm approaches as to deliver value-added products and services to clients or customers (graves, 2015).

### *3.2. BPM Life-Cycle*

Just like in project processes, a typical BPM framework of activities can be grouped into categories that can fit into project or product life-cycle. According to Bayer and Kuhn (2013), "Business process management activities can be arbitrarily grouped into categories such as design, modeling, execution, monitoring, and optimization."

#### 3.2.1. Design

Process design involves both the identification of existing processes and the proposed processes, with the aim of ensuring a correct and efficient new design (Bayer and Kuhn, 2013).

#### 3.2.2. Modeling

Modeling refers to the theoretical design and introduction of combinations of variables For example, changes in rent or materials costs, which determine how the process might operate under different circumstances (Bayer and Kuhn, 2013).

#### 3.2.3 Execution

Business process execution is putting into action designed and modeled business processes. This may be done manually or automatically or with a combination of manual and automated business process management tools.

#### 3.2.4. Monitoring

Monitoring includes the tracking of individual processes, so that information on their state can be easily seen, and statistics on the performance of one or more processes can be provided (Bayer and Kuhn, 2013). The essence of this is to enable problems in operation to be identified and corrected.

#### 3.2.5. Optimization

Process optimization involves retrieving process performance information from modeling or monitoring phase; identifying the potential or actual bottlenecks and the potential opportunities for cost savings or other improvements; and then, applying those enhancements in the design of the process.

### *3.3. Evolutions in Process Management*

BPM as a professional discipline has been around since the 1950s, and has celebrated a number of phases so far. The literature reports that it took root in the industrial age of 1950-1960 (with focus on specialization of labor, task productivity, and cost reduction); to the information age of the 1970-80s (an era of quality management, continuous flow and task efficiency); to the Process Reengineering era of 1990s (with its introduction of innovations, "Best Practices", Better, faster, cheaper approaches, and e-commerce); and finally, to the current Business Process Management (BPM) methodologies (which emphasize Assessment, Adaptability, and Agility; 24x7 Globalization and Continual Transformation, since the year 2000). Despite the laudable milestones BPM has so far reached under its umbrella body, the Association of the Business Process Management Professional (ABPMP), much is still to be done for it to gain a broad recognition as a professional discipline (Lusk, Paley and Spanyi, 2005). This history has revealed, and as well, amplified the reason why a number of Business Process Improvement (BPI) methodologies that fared well in the earlier dispensations, have faded away in the process of time, thus leaving the stage for pragmatic approaches with emphasis on measurability, flexibility and continual improvements, such as Lean Manufacturing and Six Sigma systems. At least, a general knowledge of key features of the major BPI methodologies that have been in use over time, is necessary for project managers to appreciate this reality in the event of choosing appropriate BPI tools for enhanced project success in today's competitive age.

### *3.4. What is Business Process Improvement (BPI)?*

Business Process Improvement (BPI) is the practice of identifying, analyzing and improving upon existing business processes within an organization or project for the purpose of optimization or meeting specifications or standards of quality. BPI leads to quality improvement, service enhancement, cost reductions and productivity increases of business activity or process project. It results in better operational performance and higher competitive advantage in the marketplace. This means optimizing project success by achieving process excellence. Process improvement is an ongoing practice and should be followed up with the analysis of tangible areas of improvement. It's a journey that begins from basic capability maturity levels to the highest capability maturity process models. When implemented successfully through

pragmatic approaches, the result can manifest in several ways, including enhanced product quality, customer satisfaction, customer loyalty, increased productivity, development of skills of employees, efficiency and increased profit resulting from higher and faster ROI (BPM Institute, 2000).

### 3.5. How Do Organizations Establish High Performance Processes?

The key to establishing high performance process is to understand their current maturity and performance of a process or process groups. Identifying the level of performance is required, followed by establishing a path for achieving the desired maturity and performance. Assessing the maturity of a process requires a multi-dimensional perspective, which involves breaking down the key elements of high performance process and asking questions such as the following (Roeglinger & Becker, 2012):

- Are desired outcomes clearly defined, understood and aligned with company objectives?
- Does the process have clear ownership and performance accountability?
- Is the process streamlined, optimized, consistent and standardized?
- Is effectiveness measured with enabling technologies in place to achieve excellence?

### 3.6. Process Maturity Curve

The Business Process Improvement (BPI) is a means of answering the foregoing questions, evolving processes along the maturity curve, and migrating the business towards a process focused organization. The Process Maturity Curve has five levels: it begins with ad-hoc activities at the individual level, to the development of Repeatable and standardized processes, the establishment of Controlled/consistent processes, Managed processes, and at the peak is, Optimized processes (Roeglinger & Becker, 2012).

### 3.7. Capability Maturity Model (CMM)

CMM is a core model that is associated with the Process Maturity Curve. The underlying theory is that high quality software can be produced by high quality processes. It allows developers to repeat their successes and avoid repeating their failures. The following are four basic principles and stages of CMM (Najjar & Al-Sarayreh, 2015):

- Stage 1: Initial stages process – ad-hoc, inconsistent and even chaotic.
- Stage 2: Repeatable basic and consistent processes are established and repeated for similar projects.
- Stage 3: Defined processes, well-defined, documented, standardized and integrated usually into software for the entire organization with consistent practices in place.
- Stage 4: Managed Stage/Process. At this level, strategic analysis is performed through data collection on the quality of process, with software and processes clearly quantified.
- Stage 5: Optimizing Stage. Here proactive process improvement is implemented through qualitative feedback. This helps in developing new ideas and technology.

#### 3.7.1. The Limitation of CMM

CMM was originally designed and used by the US Department of Defense to gauge whether government contractors were able to successfully complete software projects. In real life, well documented processes and procedure do not necessarily create successful software projects (Najjar & Al-Sarayreh, 2015).

### 3.8. How Can a Project Process Be Bettered by BPI?

The goal of every BPM is to see that all tasks and stages of process occur efficiently and effectively throughout the entire production chain, offering a highly perceived value to the customer upon delivery of product or service. The greater the perceived value, the more the customer will be willing to pay to enjoy it. And if the processes for delivery are effective without wastes and with high operational productivity, they will enable the company achieve a good profit margin (Graves, 2015). This makes process improvement a crucial activity for optimizing project success.

Hence, BPI is a singular initiative or project to improve the alignment and performance of a particular process with the organizational strategy and customer expectations. It includes the selection, analysis, design, and implementation of the improved process.

### 3.9. 4-STEPS Business Process Improvement (BPI) Model

For improvement to occur, the new process should follow some steps and design principles. A lot has been suggested in the literature to this effect. They can be summarized in the following suggested 4-Steps BPI Model, which aligns with the BPM Life-cycle (Bayer and Kuhn, 2013):

- Step 1: Understanding the process you want to improve. This entails a business process definition and analysis, with a view to understand the current processes and how they work. To help with this, the project manager can either engage the services of a Professional Process Analyst or do it in-house. In the course of this, talking to the people involved in the project is crucial. Indeed, there is no one better able to tell you exactly where the difficulties lie than those who work day-to-day with the process.
- Step 2: Finding out improvement for the process. This is called "Process Modeling." After the analysis, you should model the new process. You will need to adopt the best way that gets faster results, using fewer resources. At this point, you should make another diagram and share ideas with your team. In the course of this, you may try to ask questions that deduce answers to the purpose and flow of processes; show whether or not, redundancies exist;

any problems, quality or compliance issues, and why they occur; the necessity of the tasks; what should be done, by who and where; who is best qualified to act; automation issues; the major issues and wastes, and how they could be eliminated; and standards to be achieved, and how to control and monitor continuous improvement.

- Step 3: Implementing the Improvement. After process modeling, it's time to get started. Effectively put into action, the modeled process and get everyone on board. Then, examine the implementation to see whether or not the new ideas work and if the improvement will succeed.
- Step 4: Executing and Monitoring the Improvements. Controlling the execution is crucial in the improvement cycle. How? Configure your process in a BPM Solution that allows automation. The execution of the process will generate the indicators you need to check the effectiveness of the improvement.

The ultimate goal of BPI is continuous improvement. This is because there will always be a new point of improvement and new bottlenecks. The process of improving processes further leads to "Process Optimization", which in turn, leads to "Project Success optimization".

### 3.10. Basic Principles of Process Improvement Design

Many principles of business process improvement exist in the literature, but they all are based on the following two basic design cornerstones:

- Retaining Activities that Add Value: The key principle in assessing this is, does the activity add value to the service or product? If yes, we must devote our full attention to it so that it is performed in the best possible way during the process. As for activities that do not add value, they must be eliminated from the new process.
- Decreasing activities most likely to generate a fault in the process. Whenever a risky activity is part of the process, you need to find a way to eliminate it or to simplify its implementation. Use a more appropriate technology. There is no point doing what should not be done efficiently.
- To sum up, Process Improvement occurs after analyzing current processes, redesigning the process of activities that do not add value or that bring great risks by eliminating them (or at least simplifying them), constantly following normative rules and seeking to make easy business rule implementable with the creation of reusable standards – all within the aim of adding more values to the product or service, and ultimately, offering an improved customer experience.

### 3.11. BPI Methodologies

As already indicated above, BPI often involves a systematic approach which follows a specific methodology but there are different approaches that have been introduced through the ages. They include the following major ones - only a few is sampled in this work due to space constraint: Total Quality Management (TQM), Business Process Re-engineering (BPR), Balanced Scorecard, Flowchart, Ishikawa diagrams, Lean Manufacturing and Six Sigma. Let us have a brief look at the foregoing process improvement methodologies for the purpose of familiarization with their key features, with a view to appreciate their appropriateness in the course of choosing process improvement initiatives.

#### 3.11.1. Total Quality Management (TQM)

TQM is a reference to organization-wide efforts to create an industrial environment in which the organization continuously improves their ability to provide goods and services that customers will find highly satisfactory. Ciampa (1992) writes that the term, "Total", emphasizes that all departments (including both production and support services) are obligated to improve their operations; top management on their part, is also involved, in that, executives are obligated to actively support quality improvement through adequate funding, training, staffing, and goal setting. Furthermore, the author argues that while there is no consensus in approach, TQM efforts typically lean heavily upon the previous tools and techniques of quality control.

##### 3.11.1.1. The Key Concepts in the TQM Effort

There following are the key concepts of TQM as outlined by Houston (1988): Quality is defined by customers' requirements; Top management has direct responsibility for quality improvement; Increased quality comes from systematic analysis and improvement of work processes; and Quality improvement is a continuous effort and conducted throughout the organization. TQM enjoyed widespread attention during the late 1980s and early 1990s before being overshadowed by ISO 9000, Lean manufacturing, and Six Sigma (Lusk, Paley, and Spanyi, 2005).

#### 3.11.2. Business process re-engineering (BPR)

BPR was originally pioneered in the early 1990s as a replacement for TQM (Hammer and Stanton, 1995). It focuses on the analysis and design of workflows and business processes within an organization. The aim is to help organizations radically restructure their business processes by fundamentally rethinking how they do their work in order to improve customer service, reduce operational costs, and become world-class competitors (Business Process Re-engineering Assessment Guide, 1997). An early BPR proponent, Thomas H. Davenport (1990), writes that "a business process is a set of logically related tasks performed to achieve a defined business outcome. Re-engineering emphasized a holistic focus on business objectives and how processes related to them, encouraging full-scale recreation of processes rather than iterative optimization of sub-processes".

Business process reengineering is also known as business process redesign, business transformation, or business process change management. Habib & Shah (2013) report that research findings reveal that there are five key dimensions to BPR. They are:

- Project Scope: BPR implementation must begin with the definition of the scope along with realistic expectations, clear vision and goal.
- Top management Commitment: must be ensured for success.
- Availability of resources: sufficient resources must be in place, in terms of BPR know-how, I.T, and so on.
- Project management: project management skills play a major role for success.
- Change management techniques must be brought to bear.

The authors report further that BPR in public sector is not different from private sector, except that the situations and reason for adapting the methodology vary.

### 3.11.3. Balanced Scorecard

Balanced Scorecard is a strategic performance management tool. It is a semi-standard structured report, that can be used by managers to keep track of the execution of activities by the staff within their control and to monitor the consequences arising from these actions. , Robert, Norton & David (1992) explain that the phrase 'balanced scorecard' primarily refers to a performance management report used by a management team, typically focused on managing the implementation of a strategy or operational activities. According to the authors, the key features that describe a Balanced Scorecard include the following: It focuses on the strategic agenda of the organization/coalition concerned; a set of measurements to monitor performance against objectives; a mix of financial and non-financial data items (originally divided into four "perspectives" - Financial, Customer, Internal Process, and Learning & Growth); and, a portfolio of initiatives designed to impact performance of the measures/objectives (Robert, Norton & David (1992)-

### 3.11.4 Flowchart

A flowchart is a pictorial representation of the sequence of steps and decisions needed to perform a process. Each step in the sequence is noted within a diagram shape. Steps are linked by connecting lines and directional arrows with a view to allow anyone to view the flowchart and logically follow the process from beginning to end (1). A flowchart is therefore, is a powerful business tool that communicates the steps in a process very effectively and efficiently. The first structured method for documenting process flow, the "flow process chart", was introduced by Frank and Lillian Gilbreth in the presentation "Process Charts in 1921.

#### 3.11.4.1. How to Make a Flowchart

There are several ways to make a flowchart. Software Systems Engineering Vocabulary states that Originally, flowcharts were created by hand using pencil and paper. Later on, the use of drawing templates made of plastic flowchart shape outlines, helped flowchart makers work more quickly and gave their diagrams a more consistent look. But the advent of the personal computer made things much better.

### 3.11.5. Ishikawa Diagrams

Ishikawa diagrams are causal diagrams created by Kaoru Ishikawa that show the causes of a specific event (Ishikawa, Kaoru (1968). They are alternatively fishbone diagrams, herringbone diagrams, cause-and-effect diagrams, or Fishikawa (Hankins, 2001). Ishikawa diagrams were named after their founding father in the 1960s, Kaoru Ishikawa, who pioneered quality management processes in the Kawasaki shipyards, and in the process became one of the progenitors of modern management.

According to Hankins (2001), Ishikawa diagrams are commonly used in product design and quality defect prevention by identifying potential factors causing an overall effect, with each cause for imperfection seen as a source of variation. Causes are usually grouped into major categories to identify and classify these sources of variation.

#### 3.11.5.1. Advantages

Isikawa diagrams provide highly visual brainstorming tool which can expose instances of root causes; quickly identify if the root cause is found multiple times in the same or different causal tree; allows one to see all causes simultaneously; and serve as a good visual tool for presenting issues to stakeholders (Hankins, 2001).

#### 3.11.5.2. Disadvantages

However, when dealing with complex defects, Isikawa diagrams might yield a lot of causes which might become so visually cluttering that Interrelationships between causes are not easily identifiable (Hankins, 2001)-

### 3.11.6. Six Sigma (6σ)

Six Sigma (6σ) is a set of techniques and tools for process improvement that was introduced by American engineer, Bill Smith, while working at Motorola in 1980 (Bertels, 2003). The term "six sigma" comes from statistics and is used in statistical quality control, which evaluates process capability. Originally, it referred to the ability of manufacturing processes to produce a very high proportion of output within specification. Processes that operate with "six sigma quality" over the short term are assumed to produce long-term defect levels below 3.4 defects per million opportunities (DPMO). Each Six Sigma project carried out within an organization follows a defined sequence of steps and has specific value



targets, for example: reduce process cycle time, reduce pollution, reduce costs, increase customer satisfaction, and increase profits (Anthony & Kumar, 2014).

Features that make Six Sigma more pragmatic than previous quality-improvement initiatives include (Anthony & Kumar, 2014):

- A clear focus on achieving measurable and quantifiable financial returns from any Six Sigma project.
- An increased emphasis on strong and passionate management leadership and support.
- A clear commitment to making decisions on the basis of verifiable data and statistical methods, rather than assumptions and guesswork.

Six Sigma projects follow two project methodologies inspired by Deming's Plan-Do-Study-Act Cycle (Anthony & Kumar, 2014). These methodologies, composed of five phases each, bear the acronyms DMAIC and DMADV (De Feo & Barnard, 2005). DMAIC is used for projects aimed at improving an existing business process. DMADV is used for projects aimed at creating new product or process designs.

#### 3.11.6.1. The Five Steps of DMAIC

The DMAIC project methodology has five phases (Anthony & Kumar, 2014):

- Define the system, the voice of the customer and their requirements, and the project goals, specifically.
- Measure key aspects of the current process and collect relevant data; calculate the 'as-is' Process Capability.
- Analyze the data to investigate and verify cause-and-effect relationships. Determine what the relationships are, and attempt to ensure that all factors have been considered. Seek out root cause of the defect under investigation.
- Improve or optimize the current process based upon data analysis. This is done by using techniques such as design of experiments, poka yoke or mistake proofing, and standard work to create a new, future state process. Pilot runs are usually set up to establish process capability.
- Control the future state process to ensure that any deviations from the target are corrected before they result in defects. Control systems are implemented, such as statistical process control, production boards, visual workplaces, in order to continuously monitor the process, and this procedure is repeated until the desired quality level is obtained.

Webber & Wallace (2006) write that some organizations add a *Recognize* step at the beginning, which is to recognize the right problem to work on, thus yielding an RDMAIC methodology

#### 3.11.6.2. The Five Steps of DMADV

The DMADV project methodology, is also known as DFSS ("Design For Six Sigma"), features five phases (Anthony & Kumar, 2014):

- Define design goals that are consistent with customer demands and the enterprise strategy.
- Measure and identify CTQs (characteristics that are Critical To Quality), measure product capabilities, production process capability, and measure risks.
- Analyze to develop and design alternatives
- Design an improved alternative, best suited per analysis in the previous step
- Verify the design, set up pilot runs, implement the production process and hand it over to the process owner(s).

#### 3.11.6.3. Rules for Successful Implementation of Six Sigma

Six Sigma identifies several key roles for its successful implementation (Harry & Schroeder, 2000):

- The support of top management is a prerequisite. They are responsible for setting up a vision for Six Sigma implementation, empowering the other role holders by granting them the freedom and resources to explore new ideas for breakthrough improvements.
- *Champions* are needed to take responsibility for Six Sigma implementation across the organization in an integrated manner. The Executive Leadership draws them from upper management. Champions also act as mentors to Black Belts.
- *Master Black Belts*, identified by Champions, act as in-house coaches on Six Sigma. They devote 100% of their time to Six Sigma. They assist Champions and guide Black Belts and Green Belts. Apart from statistical tasks, they spend their time on ensuring consistent application of Six Sigma across various functions and departments.
- *Black Belts* operate under Master Black Belts to apply Six Sigma methodology to specific projects. They devote 100% of their valued time to Six Sigma. They primarily focus on Six Sigma project execution and special leadership with special tasks, whereas Champions and Master Black Belts focus on identifying projects/functions for Six Sigma.

- *Green Belts* are the employees who take up Six Sigma implementation along with their other job responsibilities, operating under the guidance of Black Belts.

Bertels (2003) writes that special training is needed for all of the above practitioners to ensure that they follow the methodology and use the data-driven approach correctly. Furthermore, the author adds that some organizations use additional belt colors, such as *Yellow Belts*, for employees that have basic training in Six Sigma tools and generally participate in projects, and "White belts" for those locally trained in the concepts but do not participate in the project team. "Orange belts" are also mentioned to be used for special cases (Harry, et al, 2011).

### 3.11.7. Lean Manufacturing or Lean Production

Lean manufacturing or Lean production is a systematic method proposed by America in response to Japanese competition for the minimization of waste. In line with the BPI Design basic principles discussed earlier, Lean manufacturing proposes to improve factors that add value, and reduce what is wasted on all other factors. The key objective is to maximize customer value while minimizing waste (Anthony & Kumar, 2014). Simply put, Lean means creating more value for customers with fewer resources.

#### 3.11.7.1. Lean Principles

Lean system, like Six Sigma, is anchored on the basic BPI Design principles. The literature reveals the following core principles upon which Lean system is built (Anthony & Kumar, 2014):

- The understanding of customer value and a focus on key processes that continuously increase it with the ultimate goal of providing a perfect value to the customer through a perfect value creation process that has zero waste.
- The changing of the focus of management from optimizing separate technologies, assets, and vertical departments to optimizing the flow of products and services through entire value streams that flow horizontally across technologies, assets, and departments to customers.
- Eliminating waste along entire value streams, instead of at isolated points, creating processes that need less human effort, less space, less capital, and less time to make products and services at far less costs and with much fewer defects, compared with traditional business systems.

In view of the foregoing, numerous benefits accrue to companies from the engagement of Lean system. For example, they are able to respond to changing customer desires with high variety, high quality, low cost, and with very fast output times. Furthermore, information management becomes much simpler and more accurate (Anthony & Kumar, 2014).

### *3.12. Selecting Pragmatic Process Improvement Initiatives*

As already observed from the evolution of BPR, although all the foregoing BPI approaches have enjoyed some measures of success in their own times, with the passage of time, most of them have been "considered as a passing fad or temporary fix by management and staff of corporations" (Anthony & Kumar, 2014). In the situation, a quest for a dynamic process improvement initiative that is appropriate for this age, needs not only to consider the essential features, merits, pros and cons of each methodology, but also, to understand that global emphasis has shifted from Process Reengineering era of 1990s, to the current Business Process Management (BPI) methodologies which emphasize Assessment, Adaptability, and Agility; 24x7 Global Business and Continual Transformation since the year 2000 (Lusk, Paley, and Spanyi, 2005). We need to understand that with the passage of time, that Lean and Six Sigma methodologies have been acknowledged as pragmatic BPI tools for resolving quality or process related issues in both manufacturing and service industries of all sizes and disciplines; they have been found to have great impacts on their bottom lines. Therefore, Lean and Six Sigma are strongly believed to adequately serve the project managers' need for process improvement initiatives that could optimize project success. Each of them can be used separately with great benefits; but better results will accrue when both strategies are combined.

Three options are open to a project manager who desires to install a pragmatic process improvement initiative. The first option is to engage the services of Lean Six Sigma Consultants, but the cost effectiveness must be properly considered with the overall project budget and success in mind; the second option is to send champions for requisite training with Lean Six Consultants – but again, the size of the project as well as affordability must be considered. Then the last option is to take steps to imbibe the Lean Six Sigma culture by studiously following the essential steps outlined below, with the support of Lean Six Sigma coaches.

### *3.13. Steps to achieve Lean Six Sigma Systems*

The Improvement Design Principles already outlined in the 4-Steps Business Process (BPI) Model needs to be followed (see on 3.9 above). In addition, the following steps should be implemented to create the ideal Lean Six Sigma System:

- Design a simple system
- Recognize that there is always room for improvement
- Continuously improve the Lean Six Sigma System design
- Avoid the pitfalls that lead to process improvement failure, and imbibe the factors that motivate success. It has been observed that the implementation of even dynamic process improvement methodologies, such as Lean and Six Sigma, might still end up in failure if the factors that lead to process improvement, success or failure are not carefully considered. According to Rever (2008)

process improvement projects fail for reasons like – lack of sponsorship, poorly chosen measurement metrics, teams not working together, recommendations based on hunches, instead of data and facts, and a self-deceit that claims that success has occurred whereas it is not so in reality. Furthermore, the author proffered that the following steps, if proactively taken will motivate success: Developing good relationship with all stakeholders; Establishing sound ground rules for tackling issues associated with process improvement; Applying proper facilitator skills such as good listening, participation, maintaining momentum, exemplary leadership, organization, and good communication; Incorporating the process improvement methodology into the organizational culture; and utilizing powerful testing procedures within every project.

#### 4. Conclusion

The literature has revealed that a major challenge in the rich history of project management had been the lack of consensus on the nature and definition of project success that considered the disparate interests of all stakeholders, over time (Cleland & Ireland, 2007; Kloppenborg & Opfer, 2002; Moris, 1994; Sauer, Gemino, & Reich, 2007; Bannerman, 2008). In order to overcome this age-long hiccup, project success has been defined in this work in a holistic manner that appeals to the vested interest of stakeholders across the board, in a timeless way. This approach was based on Bannerman's (2008) Multi-Level Framework for project success definition. The framework defines project success as one measured by five key success metrics, namely, project management, process management, product management, business management, and strategic management. The objective is to take care of the interests of the stakeholders across the board, including, project managers and their teams, end users of products or services delivered, the organization with its immediate investment goals, as well as, the society with its longer term developmental needs. Of all five levels listed above, process management underlies the rest, and forms a fulcrum around which they revolve and depend on. Hence, a successful process improvement initiative will likely impact positively on the rest four key result areas, all things being equal.

Basically, both literature and research affirm that a significant positive relationship exists between project success optimization and process improvement (Bakotic & Kirnic, 2017). Given this scenario, a proper implementation of pragmatic process improvement methodologies, will most likely enhance the chances of optimizing project success. This is the key thesis of this seminar. Of which, the main objective is to expose project managers and their organizations to pragmatic Business Process Improvement (BPI) methodologies that can lead to optimized process project success (and hence, optimized project success) in the present industrial dispensation. This seminar became necessary given that the findings of research have shown that lack of knowledge about pragmatic tools (like Lean Six Sigma System) has been among the greatest obstacles to their adaptation and implementation, especially, among SMEs (Anthony & Kumar, 2014). Whereas, many BPI methodologies have existed over the years, most of them have faded away in the course of time. However, Lean Manufacturing and Six Sigma methodologies, due to their relevance to the present times, have been acknowledged among the pragmatic tools that have stood the test of time, in offering solutions to most process improvement issues in both production and service industries of all sizes and disciplines. Furthermore, an integration of both tools has been especially affirmed by empirical literature, to yield added advantages than derived from either of them separately (Anthony & Kumar, 2014). Therefore, Lean Six Sigma Systems is hereby recommended to project managers and organizations who are on a quest for pragmatic initiatives that optimize process success for an optimized project success, provided that factors enhancing process project success are maximized, and those that lead to process project failure are minimized (Rever, 2008).

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## Annexure

**Integrated Guidelines for Project Process Management (IGPPM)***Understanding Practical Guidelines for Project Success*

There are three identifiable levels in project management, namely: Level 1: Project Development/Conceptualization; Level 2: Project Implementation; and Level 3: Project Conclusion. Level 1 consists of the first 3 phases of the project, that is, Definition, Initiation, and Planning; Level 2 consists of Project Execution and Monitoring and Control; whereas, Level 3 consists of the Project Conclusion. BIS (2010), among many other literatures, have offered an interesting, comprehensive, and helpful brochure of practical guidelines on how to organise, plan, and control projects, which is believed that project managers will find very beneficial. Those practical guidelines for project success as presented are generally tailored along the three project levels and stages as a checklist to help the project manager towards success. Haughey's (2019) version of the guidelines included 21 very interesting questions which can be found to be very concise for busy project managers. PBOK also has offered a helpful set of practical guidelines in terms of its 7 Principles, 7 Themes, and 7 Processes. Numerous other authors have also provided practical guidelines for successful project management.

*Developing Integrated Guidelines for Project Process Management (IGPPPM)*

Building upon the above guidelines found in the literature, this researcher has compounded an Integrated Guidelines for Project Process Management (IGPPPM). IGPPPM is a compound model for project integration management that incorporates practical prescriptions from Haughey (2019) and BIS (2010). If IGPPPM is taken together with the PBOK Principles, Themes and Processes (see on Annex 1), it will likely prove an invaluable comprehensive model for process mapping, definition, analysis, improvement and standardization and control, towards enhance project success (see on Annex 2).

This explains why business process management/improvement skill is an essential competence for every project manager. It is not enough to understand and follow the process processes; rather, it pays for the project manager to understand and employ also, process improvement methodologies that help to maximize customer satisfaction, business returns by eliminating wastes and adding value. Hence, the next segment delves into the basics of Business Process management and improvement.

Project Levels	Project Stages/Activities	Project Checklist Questions
LEVEL 1: PROJECT DEVELOPMENT/CONCEPTUALIZATION	- STAGE 1: PROJECT DEFINITION - STAGE 2: PROJECT INITIATION - STAGE 3: PROJECT PLANNING WORKFLOW OF ACTIVITIES: Procurement of project sponsorship, Establishment of Steering Committee, Definition of goals, objectives, scope, coordination, risk issues, budgets, Appointment of project manager, customer representation, Definition of Roles and Responsibilities, the right resources, and time scale approaches, and communication to the stakeholders to get agreement.	NOTE: Questions 1-6 pertain to definition and initiation stages Q1: What is the problem? Q2: Will the development of a project solve that problem? Q3: What are the specific goals of the project? Q4: Do we have enough resources to create and support the project? Q5: Do you have sufficient Business Sponsorship and Leadership? Q6: Have you defined and understood the business objectives and benefits? NOTE: Questions 7-21 pertain to the project planning stage. Q7: Have you developed a detailed project plan? Q8: Is the project a manageable size? Q9: Have you defined a detailed project budget? Q10: Are you managing the project risk? Q11: Have you appointed

		<p>an experienced project manager?</p> <p>Q12: What is the project purpose, vision, or mission?</p> <p>Q13: Are there measurable objectives or success criteria?</p> <p>Q14. Do you have a high level description of the project, requirements and risks?</p> <p>Q15: Can you adequately schedule and budget high level milestones?</p> <p>Q16: Do you have an experienced and effective User Representation?</p> <p>Q17: Have you clearly defined the project roles and responsibilities?</p> <p>Q18: Do you have enough experienced resources?</p> <p>Q19: Are the User Requirements realistic?</p> <p>Q20: Have you based your development on a prototyping iterative approach?</p> <p>Q21: Do you have a comprehensive implementation plan?</p>
LEVEL 2: PROJECT IMPLEMENTATION	<p>STAGE 4: PROJECT EXECUTION</p> <p>STAGE 5: PROJECT MONITORING AND CONTROL</p> <p>WORKFLOW OF ACTIVITIES: Determination of project size, project budget, project risks, prototyping, test plan, and detailed implementation plan. Delivery the product, service or wanted result</p> <p>Keeping control, regular monitoring, conducting tests, control and reporting of issues, risks, progress and continuous checking of the business case, as to ascertain that the expected benefits will be realized, and remain valid</p>	<p>Questions 22-24 pertain to the execution, monitoring and control stages.</p> <p>Q22: Are all resources being tracked?</p> <p>Q23: Is the project on budget and on time?</p> <p>Q24: Can resource planning be optimized?</p> <p>Q25: Are there major roadblocks that require change management?</p> <p>Q26: Are you monitoring progress regularly?</p> <p>Q27: Are you distributing regular progress reports?</p> <p>Q28: Have you planned and conducted structured testing?</p> <p>Q29: Are you achieving the right balance of consultants and leadership?</p>
LEVEL 3: PROJECT CONCLUSION	<p>STAGE 6: PROJECT CLOSURE</p> <p>WORKFLOW OF ACTIVITIES: A formal signoff; A post implementation review; Learning the lessons; Realizing</p>	<p>NOTE: Questions 30-37 pertain to the closure stage.</p> <p>Q30: Are the project's completion criteria met?</p>

	the project benefits; and Celebrating success.	Q31: Is there a project closure report in progress? Q32: Have all project artifacts been collected and archived? Q33: Has a project post-mortem been planned? Q34: Have you conducted a Post Implementation Review? Q35: Will the deliveries and benefits of your project survive? Q36: Have you looked at the lessons learned? Q37: Have you celebrated success of your project?
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