

BUSINESS PROCESS EXCELLENCE – SYNERGIES OF SIX SIGMA AND ERP

What is Business Process?

“A business process is a structured set of business activities designed to deliver a product or service to meet the expectations of the customer and stakeholders involved in the business whether directly or indirectly.”

A typical business process is depicted below, popularly known as SIPOC diagram indicating Suppliers, Inputs, Process, Outputs and Customers.

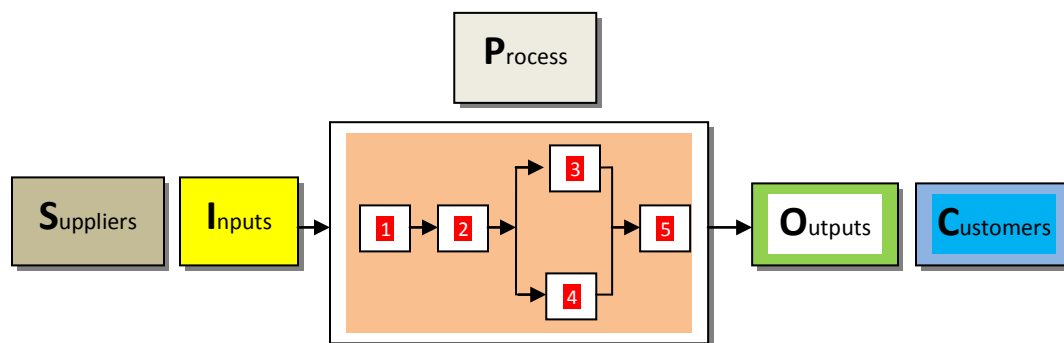


Figure 1: Typical Business Process Flow

What is Business Process Excellence (BPE)?

“Business Process Excellence is a state of designing or delivering a business process effectively and efficiently or excelling (performing) a business activity (product or service) in an outstanding manner with a superior quality to meet the expectations of the customers and stakeholders by adding value at each level.”

What is the need for Business Process and why should it be Excellent?

A business process is required to perform the business activities in a systematic manner and the business process should be excellent to deliver outstanding and value added results (i.e., product or service).

What are the outcomes of Business Process Excellence?

- Optimum Utilization of Resources
- Conservation of Natural resources
- Improves Productivity
- Reduces Lead Time of Activities
- Faster Service look-ups
- Lowers the Cost of the Product or Service
- Lowers the business risk
- Improves Profitability and Return on Investment
- Maximizes Shareholders Wealth
- Greater customer and stakeholders' satisfaction

What is Six Sigma (6σ)?

“Six Sigma is a Business Process Management Strategy aimed at improving the quality of a business process by minimizing defects”. Six Sigma allows 3.4 Defects Per Million Opportunities (DPMO) in each product or service related business process transaction”.

*Sigma (σ) is a Greek letter used to represent Standard Deviation (SD) in Statistics. 6σ means 6 (six) **Standard Deviations** from the **Mean** (the target) in statistical lingo.*

Six Sigma being a statistical tool largely depends on **data** as it involves many statistical calculations.

Where there is an output, there is a process. If there is a process, there will be a variation in performance. When there is variation in performance the process is subjected to Six Sigma. It is more of measuring variations due to defects and identifying the *cause-and-effect* relationship between the two.

Six Sigma is variance based thinking believes that ‘a customer always looks at **variance**, as **mean** is meaningless’

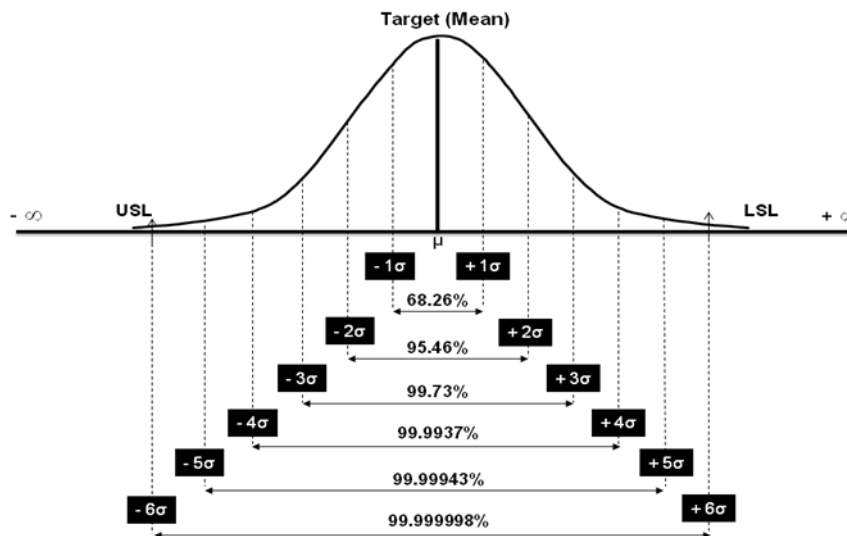


Figure 2: Six Sigma Level

Six Sigma comprises of various methods that help in increasing the effectiveness and efficiency of a business process. The two most commonly used Six Sigma methodologies include **Define, Measure, Analyze, Improve and Control (DMAIC)** and **Define, Measure, Analyze, Design and Verify (DMADV)**. The former is applied in existing business process; the latter is applied for new projects or process development. In DMAIC, improvements are made in a business process for eliminating or reducing defects whereas in DMADV, an appropriate business model is designed that helps in meeting customer requirements. In DMAIC, control systems are put in place to keep a check on future performance of a business process. In DMADV, the suggested business model is put through simulation tests for verifying efficacy in meeting customer needs and specifications. But both are aimed at minimizing the defects to 3.4 DPMO.

What is ERP?

“An ERP (Enterprise Resource Planning) is an integrated Business Process Management System that integrates all business processes, resources, functions and departments in an organization and facilitates automatic transfer of data between the above.”

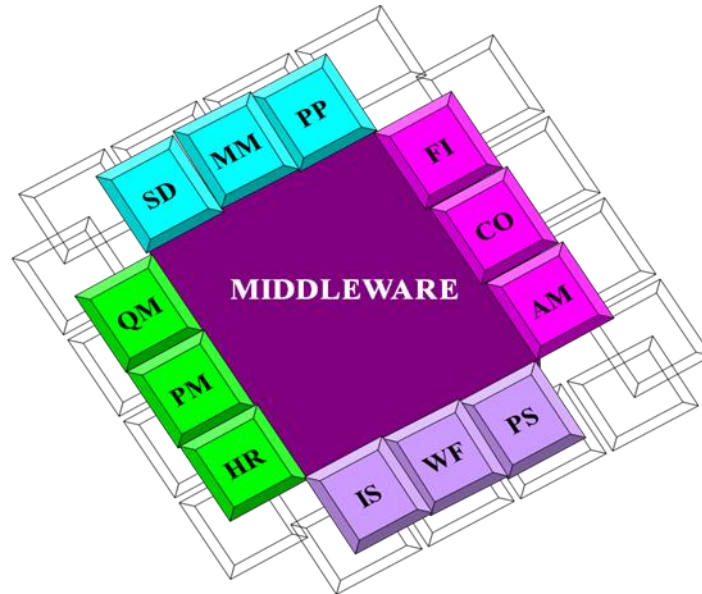


Figure 3: Integrated ERP Modules

An enterprise wide system is an off-the-shelf package that provides an integrated suite of applications which provide transaction processing and management information systems for the common core of business processes found in financial management, material management, human resource management, manufacturing and sales and distribution.

Since there is an integration of different business processes and automatic transfer of data between these businesses process, ERP can be called as Computerized Business Process Management System with an inbuilt warehouse for **data** storage and retrieval.

Six Sigma and ERP

From the above definitions of ERP and Six Sigma the common dynamic is “**data**”. The former ‘stores and retrieves the data’ and later ‘uses the data’ for statistical analysis. This does not mean Six Sigma depends on ERP. The statistical analysis is again stored in the form of data in ERP and retrieved for decision making.

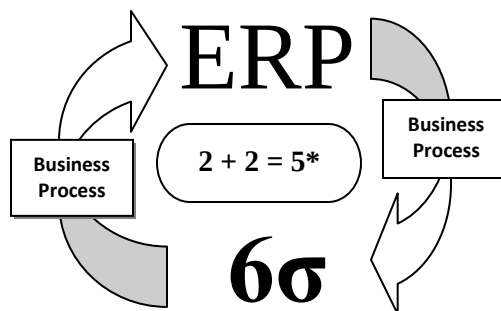


Figure 4: Synergy Effect of ERP and Six Sigma

**Positive synergy is sometimes called as 2+2=5*

Having discussed about what ERP is and what is Six Sigma, now let us look at the synergies of deploying both in an existing business process (not new). Accordingly, the following discussion is focused on DMAIC methodology and ERP.

Use of Six Sigma during implementation of ERP

The two common problems generally noticed during ERP implementation are, customer requirements gathering, project scheduling and project cost estimation. By deploying six sigma tool ‘voice of customer’ the client requirement can be collected through surveys, group discussions and interviews to plot them in a ‘voice of customer table’. Voice of Customer (VOC) table addresses the issues viz., what exactly required by the client, when it is required and what price the client is willing to pay etc. This resolves the issues during requirements gathering phase and reduces the gap between the actual

requirement of the client and ERP implementation consultants. The synergy from this will be faster implementation and lesser post-implementation issues.

As mentioned above, the second common issue during ERP implementation is project scheduling and cost estimation. The ERP implementation team can collect some past data of the client related to other processes, experiences of previous projects implementation. Such data can be analyzed by using six sigma tools i.e., Normality Testing, Cause and Effect Relationship (Fishbone Diagram), Pareto Analysis and Process Map Analysis. Normality testing helps in identifying variances of previous projects and existing processes. ‘Cause and Effect relationship’ (Fishbone Diagram) of the previous failures if any, may help in identifying the reasons for failure or success of previous projects. Pareto analysis (80:20 principles which believes in 80% of the failures are caused from 20% of the causes) helps in identifying the major reasons for previous failures. ‘Process Map Analysis’ helps in identifying the cycle time (process time + delay time = cycle time) for previous activities. All these may give a fair idea of allowance to be considered in the ERP project schedule and costs related thereto. The synergy here is perfect project implementation schedule results in reduction of implementation time and costs associated therewith.

Use of Six Sigma in post-implementation of ERP

The following table provides a broad idea about the synergies of combined use of Six Sigma and ERP

Six Sigma Phase	Six Sigma Approach	ERP Approach	Synergy
Define (D)	Pain areas of the business process are identified and defined for improvement using tools viz., SIPOC, Voice of Customer (VOC) Table, Team Charter, Process Mapping etc.	Feedback received from Customer Relationship Management (CRM) Module, web, SMS based surveys can be a great input to prepare VOC Table	Real time accurate feedback available for identifying the pain areas of the business process and helps in defining the problem clearly and quickly.
Measure (M)	Performance parameters are defined and established to measure the performance using tools viz., Process Map, Control Charts and Pareto Chart etc. Measurement system is validated for the pain areas identified in Define Phase.	As ERP is an integrated business process management system, established performance parameters (standards) are stored automatically and can be retrieved anytime.	Established performance standards are available in the ERP system can be accessed on real time basis; measurement system can be quickly established for current process, also simplifies the validation of data.
Analyze (A)	The gap between current and desired levels of performance are analyzed by using the data collected during the Measure Phase using tools viz., Cause & Effect diagram, correlation,	Data collected during Define phase and Measure phase are stored in the ERP system to generate analytical reports.	Correlation, regression analysis, causes & effect diagrams can be analyzed on real-time basis which reduces analysis time significantly. Historical

	regression analysis and flow diagrams The gap between current and desired state is also calculated in financial terms.	Facilitates access to historical data archiving for future analysis.	trend analysis provides a great input to simulate the future business processes.
Improve (I)	Having defined the problem, measured the performance gap and analyzed the reason for such gap, possible alternative solutions are devised and best possible solution is identified. Performance Improvement plan is designed and implemented to achieve the desired state of process improvement.	Facilitates the storage of analysis made in the earlier phase, alternatives solutions are available in the system. Performance improvement plans available for the process owners. Progresses of improvements are made available from time to time.	Facilitates in selecting best alternative solution out of the various alternatives available. This makes the process improvement more scientific and robust. Performance improvement in the process can be tracked by the process owners on a real-time basis and will be a great input to the control phase.
Control (C)	In this final step process improvement plans are documented and knowledge is transferred to stakeholders to keep the improved process	Control charts, Standardization of Practices are available within the integrated business process	Control measures can be established on real-time basis. System alerts can be inbuilt in the process where the process owner

	under control. Tools viz., Quality Control process charts, control charts, standardization of practices, Poka Yoke (mistake proofing) etc.	management system. Historical data of various control measures established and initiated are available as ready reference.	can be alerted immediately when the process is not performing within the defined limits
--	---	--	--

Epilogue

Using Six Sigma and ERP is not a destination for Business Process Excellence. It is a journey towards continuous improvement process. It may be superlative if the organizations make Six Sigma and ERP as *part-and-parcel* of their continual improvement plan (*Kaizen*). To achieve maximum synergies, organizations must ensure manageability of organizational changes by inculcating such culture that requires acceptability of Six Sigma and ERP. Last but not the least, drive towards achieving Business Process Excellence should maintain a balance between ‘*Process Efficiency*’ and ‘*Business Agility*’.

References:

Author’s practical experience as a SAP FICO Consultant and other ERP’s

Author’s practical experience as designated CFO of Six Sigma projects

Author’s practical experience in the fields of Finance, Accounts, Controlling and Business Analytics

www.isixsigma.com

www.searchmanufacturingerp.com