Chapter 2

Six Sigma Marketing: General Perspectives

When the world is marching towards efficiency and quality assurance, Six Sigma is considered to be one of the best quality improvement methodologies applied successfully to organizational areas like manufacturing, production, accounting and finance, sales and marketing, information systems, human resource management, etc. In this era of economic slowdown, organizations expect a high ROI and customer satisfaction from every business function. However, the productivity of sales and marketing processes has always remained as grey and debatable functional area. To elaborate the significance of sales and marketing process compared to another business process to generate significant ROI, a structured approach is required that alters the way of looking towards sales and marketing from a merely creative field to the structured process based approach. The application of Six Sigma to sales and marketing provides a channel to the creativity that results into high ROI. Different tools and techniques based on an application of Six Sigma in marketing process have been discussed in this chapter with their Key Performance Indicators (KPI) and their connection to Six Sigma supply chain matrices is presented with relevant arguments and examples. The quantification and performance of Six Sigma project is also studied through Confidence-Trust matrices.

> According to Pande et al. (2000), a Six Sigma Organization is, *"an organization that is actively working to build the themes and practices of Six Sigma into its daily management activities and is showing significant improvements in process performance and customer satisfaction."*

The objective of Six Sigma is to discover the non-value-added activities latent in the working system. Though there are a set of effective tools used to improve and reduce the loss in process, Six Sigma solutions is the most popular one and it has been regarded as the world-class strategy for quality improvement (Juran (1988), Kaplan and Nortan (1992, 1993), Hendricks and Kelbaugh (1998), General Electric (1997), Park (2003), Kumar and Nowicki (2008)). The objectives of quality improvement project using Six Sigma could be the financial benefits increment, the operations performance increment, and the better the company image (Hahn et al., (2000), Wang and Hsu (2009), Su and Chou (2008), Chakravorty (2009)). The companies achieving Six Sigma should see the results in their bottom lines and with their customers – and should not oversell their efforts. Performance against the plan is how a business typically defines its success. Business gauges success by a

multitude of metrics: revenue, income, profit, customer satisfaction, market share, return on investment, return on assets, and so on. Bottom line and planned success means reaching and sustaining goals over a period usually growth targets. According to Creveling et al. (2007), companies which effectively implement Six Sigma tools, methods, and best practices find the following benefits:

- *Systematic innovation*: Generate and define ideas linked with market opportunities in a structured way.
- *Manage risk better*: Identify critical issues early in the commercialization process in such a way that plans can be developed to mitigate or eliminate risk.
- *Higher return yield from a project portfolio*: Avoid over boarding resources with too many low-risk, small gain projects through a discriminating selection process.

The objective of any Six Sigma project leads to evaluating the accomplishment of its improvement. The economic index would be determined if the project aims to increase the financial benefit (see Hahn et al. (2000), Kumar and Nowicki (2008), Kwak and Anbari (2006), etc. for details).To tailor Six Sigma to marketing, one should start with an overview of how it works. It is found that marketing professionals rarely view their own work as something that is process-oriented. According to American Marketing Association (AMA), marketing is "*a set of processes for creating, communicating and delivering value to customers and… managing customer relationships in ways that benefit the organization and stakeholders*." The American Heritage Dictionary describes process as, "*a series of actions, changes, or functions bringing about a result*." According to Moorman and Rust (1999), the marketing function should play a vital role in managing several important connections between the customer and critical firm elements, including connecting the customer to (i) the product, (ii) service delivery, and (iii) financial accountability.

Hence, This chapter is proposing the essential tools required for SSM. The science of marketing is described keeping in mind project management, supply chains and computing technologies in tandem with the key performing indicators described in various sections below:

2.1 Six Sigma Marketing: General perspectives

As seen from the growth of Six Sigma in various organizational activities, its implications are diversified to many outside organizational activities as well. This includes marketing and sales of the organization in terms of its sigma level and performance. Six Sigma Marketing is the bridge between marketing or sales professional and quality improvement professionals (Reidenbach (2009), Webb and Gorman (2006)). This enables the professionals to explore the Voice Of Customer (VOC) and Voice Of Business (VOB) to build quality in the respective processes. Although, Six Sigma professionals and Sales and Marketing professionals have similar objectives in mind – finding the path of least resistance and sticking to what works best, the difference is that Sales and Marketing often rely on intuition and judgment, while Six Sigma relies strictly on scientific analysis of data.

2.2 Six Sigma Marketing Project Management

When we study various dimensions of Six Sigma, we realize that the primary objective of a Six Sigma project is to improve the quality of the process by reducing variation. For this, there are two approaches for selecting the right project: a model generating *quantitative* data and a model generating q*ualitative* data (Muralidharan, 2015). Some of the important issues need particular attention while selecting a project is:

- Will the project maximize profits?
- Will the project maintain the market share?
- Will the project consolidate the market position?
- Will the project open up new markets?
- Will the project maximize utilization of existing resources?
- Will the project boost company's image?
- Will the project increase (or decrease) the risk faced by the company?
- Is the project scope within the company's current skills and experience?

Most of the Six Sigma projects are the resultant outcomes of customer needs and expectations. As described by Pande et al. (2000), the results of any Six Sigma project

depend on reliable and quality data. Any data collected contains a mass of information. The problem is to extract that part which is relevant to the questions to be answered by the project, in the simplest and most logical manner. It primarily involves checking for pertinent patterns and anomalies in the data. The statistical models are chiefly concerned with simplifying reality in a reasonable and useful way that one can empirically check with the data. No model is ever 'true', but some models are more useful than others for given data and questions. Irrespective of whether the model is constituted by a quantitative or qualitative data, the model can provide:

- a parsimonious description or summary of results, highlighting important features,
- a basis for prediction of future observations,
- biological or social insight into the processes under study,
- a test of a prior theoretical relationship,
- comparison of results from different studies, and
- measures of precision of quantities of interest.

2.2.1 Six Sigma Marketing Project Selection

As mentioned by Antony (2004) the selection of right project and prioritisation of projects is one of the critical success factors of Six Sigma programme. Improper project, though executed properly will have trifling effect on business and organizational goal (Ray and Das, 2010). For this, "Top-down" and "bottom-top" approaches are proposed for project selection in literature (Harry and Schroeder, 2005).

- *Top-down approach*: This approach is based on perpetuating required organizational change for successful implementation of Six Sigma from top management to down the line. Top-down approach address different dimensions like long term cultural changes involving significant amount of expenses for training and development, synchronization of diverse organizational functions, key business priorities, issues or improvement opportunities for Six Sigma project selection. In addition to identification of project dimension this approach is proficient for building effective team to bring change at each level of the organization, identifying key processes and establishing their key performance indicators, examining process base line and identifying opportunities for improvement.

- *Bottom-top approach*: Operational level issues of the organization can be best addressed through bottom-top project selection approach. Initiation of such project is mainly based on internal voice of customer. Bottom-top projects are narrowly focused, not tightly connected with strategic requirement of the organization. For example, production manager addressing local issues related to waste, supplier or engineering needs, bottom-up approach can be used (Harry and Schroeder, 2005). Bottom-top approach is generally used by the companies in the infancy of Six Sigma implementation and shows the need to develop a data-driven process (Lynch, et al., 2003).

In addition to deciding about approach for project selection, it is important to understand different elements of good Six Sigma project. Project selection based on these elements leads to successful implementation of Six Sigma through synchronized linkage between identify, improve and establish phases. Lynch et al. (2003) identified key elements of good project based on following criteria:

- *Type of problem*: Project should address problem with unknown solution
- *Project goal*: Project should have clear numeric goals to address
- *Project tracking*: Performance and progress should be tracked through well-defined set of metrics
- *Business benefits*: Project should have visible benefits in terms of customer satisfaction, quality, cost etc.
- *Time period*: Project efforts returns should be realized in reasonable amount of period. Typically within three to six months
- *Project approach*: Project should follow DMAIC approach for problem solving
- *Tools*: Appropriate tools should be utilized during different phases of DMAIC approach
- *Process orientation*: Project should have process orientation approach

Following are the additional aspects for effective Six Sigma Marketing project management:

2.2.1.1 Deciding upon type of project

Deciding upon the type of project based on customer requirement, defect reduction, improving cost of poor quality (CPQ), cycle time reduction, cost saving is important, since it keep project management efforts focused to the deliverables of project type. However, positive implications of selected project span over other types also. For example, if project is focused on defect reduction and waste elimination, then that kind of projects will successively leads to greater customer satisfaction. Selection of proper tool cater the need of particular project type is also important. Information about different types of projects with their focus and tools required is presented in Table 2.1.

Table 2.1. *Types of projects, their focus and tools required for each*

Project type	**Focus**	**Tools**
Customer focused	Customer satisfaction, Customer retention	Kano analysis, Voice of customer table (VOCT), Interview, survey Quality function deployment (QFD), Critical to Quality (CTQ), brain storming
Defect reduction	Reducing customer defined defects for key process indicators (KPI)	Critical to Quality (CTQ), Defects Per Million Opportunities (DPMO), Process sigma, Process capability indices(PCI), Rolled throughput yield (RTY), Scrape rate, Project charter
Reducing cost due to poor quality	Improving process to optimize cost incurred due to production of defectives	Cost of poor quality (CPQ), Cost of doing nothing (CODN), Activity Based Costing (ABC)
Cycle time	Optimizing process cycle time	Value added – non value added analysis(VA-NVA)
Profit maximization	Examining returns over investment	Benefit-to-cost ratio

Marketing professionals are supposed to be abreast with adequate knowledge in executing the complete projects to the next level by retaining the quality objectives and requirements of the company.

2.2.1.2 Project Prioritization

Harry and Schroeder (2005) identified three factors based on which project prioritization can be done:

- Project's value to the business
- Resources used for project must repay i.e. based on cost benefit analysis
- Long cycle time and non face-off of customer needs are to be addressed to save organization from market evacuation.

Tools used to prioritize projects are cost benefit analysis, cause-and-effect matrix, Pareto analysis, Pareto priority index (PPI), un-weighted scoring models, theory of constrain(TOC), non numerical models, analytical hierarchy process (AHP), Quality function deployment (QFD), project ranking matrix, project selection matrix (Pyzdek and Keller, 2010) etc.

2.2.1.3 Project Scoping

Importance of Six Sigma project scoping is well portrayed by Lynch et al. (2003). Project scoping in Six Sigma is being specific about project goals from very broad and vague objective and hence making project more focused. Deciding SMART (Specific-Measurable-Achievable- Result focused-Time bound) goals should be the major objective of Six Sigma project scoping. Project scoping is vital to keep team align with DMAIC approach, and is important with reference to the following dimensions:

- Decide process boundaries: This dimension includes selection of those processes, improvement in which can have optimum impact on ultimate project goal.
- Identification of sub processes: Identification of sub processes along with relative task to accomplish is important for better alignment of process.
- Duration of the processes: Reporting of processes, sub processes and tasks along with time required to accomplish that task helps to follow time schedule of the project.

Apparent broad focus of management projects, lack of Black Belt experience, scarcity of intellectual capabilities, quick fixes culture are the major barriers to project scoping. Lack of proper project scoping leads to stretched project schedule which ultimately boil down to higher cost of project completion, frustrated and diverted human resources. Few remedial actions can be taken in order to manage project scoping properly. They are dividing large scope project into small projects, some primary information can be used to finalize scope of topic, increased experience of Black Belt in project scoping, defining project first and

scoping it properly using appropriate tools etc. Some tools used for project scoping are causal diagram, SIPOC (Supplier-Input-Process-Output-Customer), fishbone chart, Pareto analysis etc.

Six Sigma emphasizes the model regarding Y = f(X). It mathematically summarizes the fact that the output from a business process is a function of the decisions made by the process owners. The best model is that which is free of all irregularities and inconsistencies in the data leaving a very little chance for assignable causes (man, machine, method, materials, and processes) of variation. A general model building involves the following steps:

1. Studying the important descriptive statistics in order to be familiar with the data
2. Developing a reasonable model from the results of step 1 and from previous knowledge
3. Fitting the model to the data
4. Checking the goodness of fit of the model
5. Going back to step 2, if necessary
6. Using the model to draw appropriate conclusions.

The purpose of modelling is not to get the best fit to the data, but to construct a model that is not only supported by the data but also consistent with previous knowledge, including earlier empirical research, and that also has a good chance of describing future observations reasonably well. A probability model and a regression model are sought for describing these types of situations.

2.2.2 Probability Model

It is expected that the main response variable (Y) under study should be specified in the project protocol. In most cases, it is directly observable, but in some experimental trials, it may be constructed. For example, the difference between the responses at baseline before the intervention began and the final response after a certain length of treatment. In statistical models, we consider the response variable to arise at random in a certain sense: that is to say, we cannot predict in advance exactly what response each respondent will give so that random fluctuations are not reproducible. Such variability arises primarily from differences among human beings, in contrast to studies in physics or chemistry where measurements error is predominant.

When the value of a variable is subject to random variation or when it is the value of a randomly chosen member of a population, it is called a random variable. A description of the possible values of a random variable and their corresponding probabilities of occurrence is the probability distribution or the probability model. A probability distribution is a mathematical function that smoothens the histogram of observations in an informative way while retaining and highlighting the basic shape. A probability distribution is defined for both qualitative and quantitative data. Binomial distribution (for binary responses), Poisson distribution (for counts), geometric distribution, hyper-geometric distribution etc., are probability models for qualitative and discrete data. Whereas, Normal distribution, exponential distribution, Beta distribution, gamma distribution, uniform distribution, Weibull distribution, log normal distribution etc., are the probability models for continuous and quantitative data. Most probability distributions have one or more unknown and unobservable *parameters* (not explanatory variables). Most distributions have a parameter that indicates the size of the responses, generally the mean and some have a second parameter related to the shape of the distribution, may be called the variance. And there are distributions that have more than two parameters which include location, scale, shape parameters and other parameters. A marketing model will be a mix of all these parameters. More the parameters, larger the uncertainties surrounding the model.

Quite often a model based Six Sigma project seems to be easier to market than a project focussed as it works only on management by objectives (MoB). However, constructing a probability model may not be easy every time, but with some statistical knowledge, this can be made possible. As seen in reality, more than seventy percent of the successful Six Sigma projects involve analysis based on probability models and the inferences based on them ((Pyzdek (1999, 2000), LG Electronics (2000), Muir (2006), Kubiak and Benbow (2009)).

2.2.3 Regression Model

The probability distribution describes the random variability in the response variable. However, in many studies, these variables can come with systematic changes in the response under certain conditions. They are called the explanatory variables (X's). This situation can also be translated into a statistical model by looking at how the probability distribution of the response, or more precisely the parameters in it, change under these conditions. This process may need some general assumptions to be made on the variables in the model. For simplicity,

we assume that the mean of the distribution changes with the conditions of interest and variance to remain constant under all conditions. Further by assuming a linear relationship between the response and explanatory variables, the model building becomes an easy job. But in reality, this will not happen every time and hence the necessity of regression model. The above two conditions put together will give the standard (multiple) linear regression model, whereby some function of the mean changes with the conditions:

$$y_i = \beta_0 + \beta_1 x_{1i} + \beta_2 x_{2i} + \cdots \quad (2.1)$$

Where y_i is the mean for the i-th subject, x_{ij} is the observation of the j-th explanatory variable for that subject, and β_j is the corresponding unknown parameter, the *regression coefficient*, to be estimated. This model that combines some probability distribution with a linear regression has come to be known as a *generalized linear model*. This kind of models is very handy for Six Sigma project personals as they are very easy to build and interpret without any technical hazels.

2.3 Critical Evaluation of a Project

Every project needs critical evaluation before, during and after its execution. Especially, a Six Sigma project starts evaluation from its baseline performance to final sigma level calculation. This performance evaluation is the key to its success and its acceptability. For continuous evaluation also, these performance indicators are used. Some of the methods available to represent task relationship in six sigma projects are Gantt charts, PERT, CPM, Matrix based methods and system dynamics, etc. Among these Gantt charts and PERT system are project scheduling tools and majorly focus on time constraints. On the other hand the matrix based methods and system dynamics are used to identify interdependency between activities and a causal relation among them. Gantt charts are a graphical manner of representing the relationship between activities and time. Gantt charts are easy to use, but they cannot explicitly describe the relationship between different tasks confining the use of this chart in project scheduling.

PERT/CPM techniques are also known as PERT based project management system. PERT based systems are network based techniques used to design project schedule, which emphasizes predetermined project completion time along with estimated time range of

individual activities. It helps the organization in various ways, such as the ability to tell the customer exactly when their orders will be filled and to know when to order new supply and so on. The only difference between PERT and CPM techniques is that originally the time estimates for the activities were assumed deterministic in CPM and were probabilistic on PERT. Practically, there is no significant difference between these two methods.

According to Creveling et al. (2007) designing cycle time for marketing processes differs from simply creating Work Breakdown Structure (WBS) and generating Gantt charts. Defining specific gate requirements, measuring gate deliverable, tools and methods required to produce data for gate deliverables, generation of maximum value to fulfill gate requirements and balanced and trained resources play an important role in generating Critical Path (CP) of cycle time. "Designed" cycle time provides the assurance that a given project's potential is leveraged and optimized.

According to Pyzdek (2010) PERT systems are used to:

- Aid planning and control of project.
- Determine feasibility of meeting a specified dead line.
- Identify most likely bottleneck/s in a project.
- Evaluate the effect of change in the project requirements or schedule.
- Evaluate the effect of deviating from schedule.
- Evaluate the effect of diverting resources from the project or redirecting additional resources to the project.

PERT chart represents the task in a serial or parallel flow of network. The flow represents task dependencies within phases. CP identifies the longest critical tasks timeline in a phase. CP identified in the PERT/CPM chart shows managers the activity which are the most time critical. It allows managers to focus process improvement on the task that is most vital to the timely competition of the project. Since network times are based on estimates, CP is likely to vary and can be viewed as a dynamic entity. The marketing process may be imitated at this stage for better communication and understanding of the market requirements and pulses.

2.4 Measurement based Key Performance Indicators (MKPI)

With respect to a Six Sigma methodology, the key performance indicators (KPI) play a paramount role in judging the overall performance of the organization. It provides a series of measures against which internal managers and external investors can judge the business and how it is likely to perform over the short and long term. Obviously, KPI's cannot operate in a vacuum. One cannot establish a KPI without a clear understanding of what is possible, so we have to be able to set upper and lower limits of the KPI about the market and how the competition is performing. It means that an understanding of benchmarks is essential to make KPI's useful, as they put the level of current performance in context – both for start-ups and established enterprises – though they are more important for the latter. The benchmarks also help in checking what other successful organizations see as crucial in building and maintaining competitive advantage, as they are central to any competitive analysis. The best possible way to achieve a competitive edge is through the use of a measurement based KPI's, as they can establish current performance, benchmark and target levels. For each monitoring module, one can then establish what the current level of performance is and in a measurable and understandable way. The current performance can then be marketed with guaranteed results.

As different individuals and organizations will put a different emphasis on each item of information, a definitive list of what is and what is not a KPI will depend on individual decisions and will vary considerably according to the stage of company's development. Start-up enterprises need to place their emphasis on structural factors and established companies on operational performance. Some of the crucial measurements based KPI are:

- *Gross profit* is one key measures of the success of the organization. Research shows that survival rates are linked to levels of gross profit; gross profit margins above that of the competition provide clear evidence of competitive advantage.
- *Return on capital* (ROC) employed is another key measure of the success of the organization. The ability to use investment effectively is central to effective long-term development.
- *Z-score* is a measure of the liquidity of the enterprise and clearly, defines positive or negative trends.

Both gross profit and return on capital employed are part of the model balanced scorecard for overall objectives. Other components within the financial reporting module that might be considered as KPI's are factors such as the debt/equity ratio (DER), project success rates, bad debt rates, and free cash flow (FCF). Including time, budget and specification to the project reporting would also be a natural addition to the measurement based KPI's.

In addition to the creation of the enterprise balanced scorecard, in which gross profit, return on capital and Z-scores are standard elements, the identification of KPI's in each of the operational areas or knowledge centre also assist the enterprise in plan development. These KPI's will change over time, but their creation as part of the initial creation of each knowledge centre will focus and direct their operational activities. One of the most valuable contributions that KPI analysis can deliver is an understanding of the true nature of the competitive environment (Cox et al. 2003).

The KPI's are the essential part of any efficient management information system (MIS). In a decentralized planning system focused around knowledge centers, the choice of key performance indicators is the first stage in the re-evaluation of the information system for making it more valuable and relevant to the operating unit rather than one that is centrally provided. Thus, the choices of KPI determine what will drive that part of the enterprise and what information must be collected to analyse and manage it. Such information gathering or software choices create information networks that are relevant and provide data which is used specifically for operational purposes and reducing information overload. The information system also helps the management to focus on

- Action planning and implementation with an emphasis on management by objectives (MoB) which will include a standardized rate of return and detailed project control.
- Training as part of a companywide approach to focusing staff and management on essential operational requirements.
- Business planning as a core part of the business plan outline.
- Identification of necessary actions in change management, exit planning and survival and recovery planning.
- Set priorities for investment appraisal, and the choice of emphasis that should be given to the main strategies within the golden circle, consolidation (including cost cutting), market penetration, market development and product development.

2.5 Quantifying the success of a Six Sigma Marketing project

The success of any Six Sigma project can be quantified using the Confidence-Trust matrix as given in Table 2.2. Once the confidence and trust are quantified, work with the team using their experience to decide for each success of the project regarding its commercial potential. Both Confidence and trust are assessed on a scale of 0 to 1, where close to zero is considered as unsuccessful and 1 being a highly successful project. If both confidence and trust are moderate or high in their effect, the implication will be that the project could be successful and can yield huge return on investment and costs. Once the success has been assessed for confidence and trust, one can prioritize the launching of projects confidently.

Table 2.2. *Confidence-Trust ranking matrix*

Confidence	**Trust**			
	Poor 0.1-0.24	**Low 0.25-0.49**	**Moderate 0.50-0.74**	**High 0.75-1.00**
Poor 0.1-0.24	Poor	Poor	Low	Low
Low 0.25-0.49	Poor	Low	Low	Moderate
Moderate 0.50-0.74	Low	Low	Moderate	Moderate
High 0.75-1.00	Low	Moderate	Moderate	High

Confidence in above table can be considered as organizations' "Deliverable" perspective, and Trust can be regarded as customers' "Requirement" perspective. Confidence articulate the commitment of organizations to fulfil customer requirements and trust articulate faith of customers in the organization value delivery system. Engaged in improvement project, good quality of data is generated by marketing department and assurance about meeting project deadline brings confidence in employees to generate deliverables up to the expectation of customers.

The Confidence levels can be interpreted as follows:

- If major deliverables are properly documented and satisfy time, quality and cost requirements completely, confidence is considered as high (0.75-1.00).

- If very few deliverables are incomplete, confidence is considered as moderate (0.50-0.74).
- If many deliverables are incomplete, confidence is considered as low (0.25-0.49).
- If majority of deliverables are incomplete, confidence is considered as poor (0.1-0.24).

And the Trust levels can be interpreted as

- If customer requirements are fully satisfied by organizational deliverables related to time, quality and cost, the trust will be high (0.75-1.00).
- If major customer requirements are satisfied by organizational deliverables, the trust will be moderate (0.50-0.74).
- If some customer requirements are satisfied by organizational deliverables, the trust will be low (0.25-0.49).
- If few customer requirements are satisfied by organizational deliverables, the trust will be poor (0.1-0.24).

Hence, the combination of higher level of confidence and higher level of trust result into the success of Six Sigma Marketing project. The marketing personals should then concentrate on projects which yield moderate to high confidence projects for implementation.

2.6 Role of IT in Six Sigma project management and marketing

Information technology (IT) is a valuable aid in project management and marketing. Apart from providing computational support in a whole range of network scheduling calculations, it has made it possible to generation and distributes reports online for effective monitoring and control. Since a large number of activities and individuals are involved in a project, keeping everyone up to date and involved is itself a difficult task. It has been made easier through e-mail, the intranet, and the internet. It simplifies the coordination between the head office and multiple sites working in different environments. Moreover, it encourages the practice of green management of infrastructure and environment, which is the need of the hour. With these kinds of easier and cost effective methods, one can enhance the efficiency of the project and save an enormous amount of workforce and finances. Plenty of computer software are

available these days for enabling project management and marketing more effectively. The major advantages of such software are:

- easy sorting and listing of activities
- easy updating and new listings of project progress over the life cycle
- advanced analysis and reporting can be done automatically
- decision making can be done effectively as per the resources available
- modification and alterations of constraints can be done in accordance with project priority
- customer information can be made more effective and transparent
- customer reach can be made more genuine and purposeful
- Six Sigma project appreciation can be improved
- Six Sigma project success can be shared and informed

According to Bardhan (2007) there are three dimensions in which information technology can help to improve project competencies. They are:

1. *Consistency* of the business project: Consistency refers to the extent to which users are able to achieve targeted business results in a predictable manner and achieve their goal on an ongoing basis. By helping to aggregate project information across the enterprise, IT improves the ability to track project progress, correct deviations and consistently execute business plans.
2. Customer and market *relevance* of the outcome: Relevance refers to the extent to which process is customer centric on the ability to meet current, and future customers need. Used appropriately, IT help organization "high bandwidth" channels with its lead users and mainstream customers to sense tactic and emerging customer information.
3. Degree to which the project is structured to *leverage* the efforts of suppliers and value chain partners: Leverage refers to the degree to which the firm can utilize its supply chain partners. IT helps a company improve leverage in many ways including spotting low-cost and high-quality global partners and integration of existing assets from other parts of the firm.

After understanding some general perspectives about SSM in this chapter, it is important to explore major building block of Six Sigma philosophy- called "*sigma shift*". Understanding of Six Sigma is incomplete without investigating different tenets sigma shift. Chapter 3 throw light on this aspect of Six Sigma philosophy.

2.7 Relevance of Supply chain metrics in Six Sigma Marketing

Supply chain measurements or metrics such as inventory turns, cycle time, defects per million opportunities (DPMO) and fill rate are used to track supply chain performance. Commonly used Supply Chain Management (SCM) metrics can help you to understand how your company is operating over a given period of time (Mentzer, 2001). SCM can cover many areas including procurement, production, distribution, warehousing, inventory, transportation, customer service like area of logistics. However, a good performance in one part of the Supply Chain is not sufficient (Pyzdek, 2000). The solution is for you to focus on the key metrics in each area of your Supply Chain. Tracking your Metrics allows you to view your performance over time and guides you on how to optimize your Supply Chain. It allows management to identify problem areas. It also allows for comparison to other companies through like industry benchmarking. The supply chain metrics improve the logistics operations in the following ways:

- The first step is to identify the metrics that you want to use. Do not use every metric available. Rather, focus on the vital measurements necessary to your business. These can be considered your key process input variables.
- Next, you need to understand the meaning of these metrics. It is not enough for management to simply view these measurements; they must also understand the meaning behind them.
- The next step is to learn the mechanics behind the measurements. What drives them positive and negative? Try to understand the various factors that influence your results.
- Using this information, identify weakness or areas of improvement in your current processes.

- Set goals based on these improvement areas. The goals should be aggressive, but yet obtainable. Goals can be based on benchmarking against like companies or goals can be set to reflect a specific percentage improvement over past performance.
- Put corrective action in place to improve your processes. Make sure that these corrective actions do not negatively affect other areas. Also, check that all affected areas have a clear understanding of the changes.
- Monitor your results. Did your corrective actions yield your desired results? If so, what is your next area for improvement? If you did not get the desired results, what went wrong? Try to identify the root cause of your undesired results.

An effective SSM goes along with an effective SCM. To understand the pulse of the market and the customer behaviour pattern, these two should work in tandem with each other. All Six Sigma projects are generally marketed as per the sigma level of the process or project. It is not mandatory to use the Sigma scale for this. Besides Sigma, DPMO and Yield, there are other valid ways to express and measure the performance of a process or product/service. One can also use methods like control charts and process capability indicators, for this purposes.

Some of the "logistical" issues that surround SSM measures are:

- Establish guidelines for Six Sigma measures to be applied effectively across an organization – to ensure consistency.
- Six Sigma measures are not "static". As customer requirements change, Sigma performance will also change. It will be a good idea to continue calculating with the old requirement, simultaneously with the new requirement, at least for some time. This will make transition smoother and the project team will be judged fairly for their work.
- Set priorities on what can and should be measured. No one should expect accurate Sigma performance data for every part of a company in a short time.
- Sigma measures (or any other method of measures) by itself will not improve the performance. They are just report cards or milestones to show where the company is on its journey towards excellence. To bring about improvement, methods of analysis and tools are required to be used.

One may also see Muralidharan and Raval (2013) and Muralidharan (2015) for further details of SSM performance indicators and the importance of information technology in SSM.