Organizing for Six Sigma and Selecting Projects

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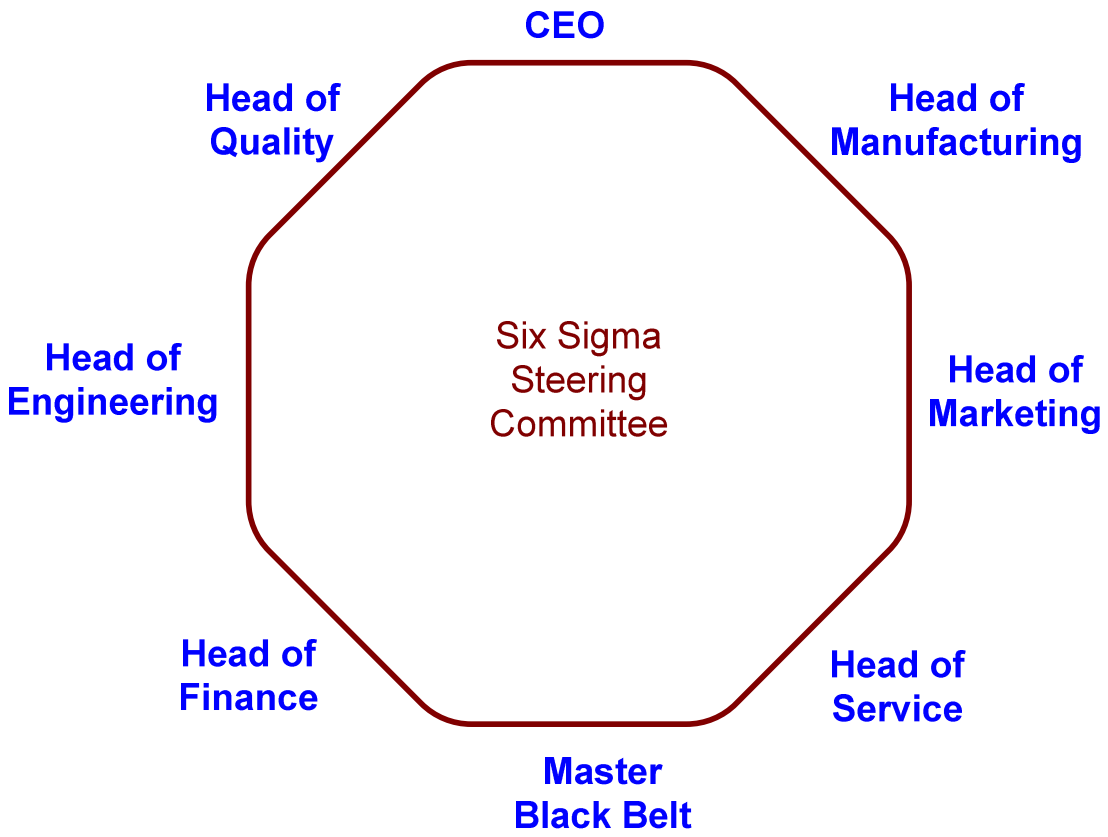
The Six Sigma Steering Committee:
Like any major initiative for change, Six Sigma Approach requires commitment of top management. It is therefore essential to define the 'Six Sigma steering committee'. Typical steering committee may look like this:

Following figure shows typical structure of Six Sigma steering committee.



Role of ***CEO*** is to provide big picture and the strategic objectives to the management team. ***Senior Management of the company, especially CEO and Quality Leader*** of have key responsibilities in creating faith in the programme. ***Master Black Belt (MBB)*** is primarily responsible to train, coach and guide project leaders (***black or green belts in Six Sigma terminology***). He/she is also responsible for reviewing projects periodically and reports the status of projects to the committee. Typical steering committee functions are:

- Ensuring that Six Sigma Projects align well with strategic goals of the company
- Deciding implementation partner
- Selection of projects and belts
- Provide adequate resources for the programme
- Sponsoring black and green belt projects
- Working on some of the projects as belts in the first phase
  - This helps in giving a message about seriousness of the effort.
  - This also helps in creating a faith and understanding the power of Six Sigma approach and tools
- Evaluating progress and financial benefits
- Recognizing belts and teams

It is important that *senior management* actively participates in setting up direction of the programme. One of the major benefits of an effective Six Sigma programme is *development of future leadership*. ***Black belts*** who demonstrate leadership skills in project implementation usually get exposed to the important processes in the company. They also start commanding certain degree of respect while demonstrating their competence as project leaders. This is fundamental for development of future leaders. Many companies who have implemented Six Sigma now require that only those who led Six Sigma Projects qualify for the key positions.

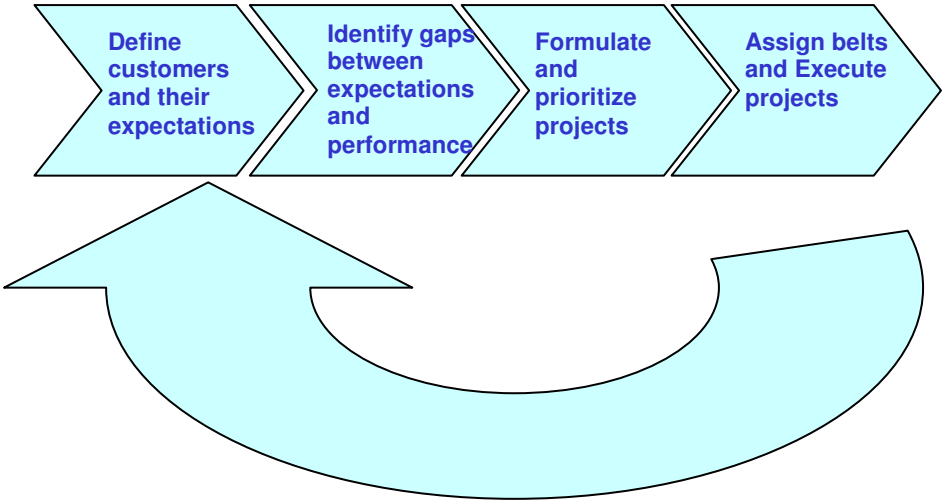
Role of head of *finance* is important in Six Sigma implementation. Each Six Sigma project requires estimating financial benefits. These benefits should be estimated by the belts and their sponsors and then approved by *financial controller*. Financial controller is appointed by head of finance. This is a very important role as financial benefits will have positive impact on the bottom-line of the company.

Selection of Six Sigma projects

This is a very important task that needs to be managed by the senior management. To ensure that objectives of Six Sigma are met, projects must be strongly linked to the strategic goals of the company.

One of major distinguishing factors between other improvement approaches and Six Sigma is its project based improvement approach. Quality Gurus have recommended use of Pareto analysis for prioritization to solve quality problems. However, this was generally limited to *product quality and reliability issues*. Six

Sigma encompasses *all business processes* and does not necessarily mean solving a problem. Management should look at Six Sigma to make business process improvements *rather than only solving problems*. No doubt, Six Sigma tools are very effective in solving problems. However, we do not necessarily start with a problem. A typical improvement cycle may look like this (Figure x.xx)



This is a simplified schematic diagram but essentially depicts the top level view of project selection. While defining customer expectations and identifying gaps, we also need to consider performance of our competitors and world class benchmarks. Many times, improvement area is identify while defining expectations of our customers. We may not have appropriate measures/metrics to assess our current performance. This obviously becomes the first step. For example, if large number of our customers expect a better service and if we do not have a measure of service time, we better start measuring it. If our customers are telling that our products fail too often, we better have a measure for reliability of products if we do not have one. However, large number of companies are today already certified to one of the quality standards such as ISO 9000, ISO/TS 16949 or QS-9000. Companies certified to these standards would usually have fair amount of data to begin with.

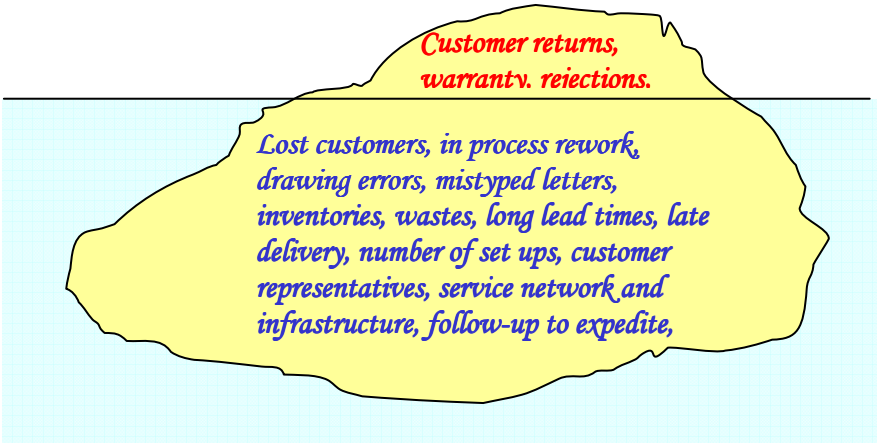
We need to prioritize the projects considering their impact on improving customer satisfaction. This in turn should improve in some way our business performance.

Guidelines for selection and defining Six Sigma Projects

Six Sigma is improvement methodology for breakthrough improvement. Company must strive for a sigma level that will give them a competitive advantage. One of simple approaches for starting is to find areas where executives/managers have to spend too much time in firefighting or solving problems that recur like fashions. This could be

- Customers' calls for delivering parts, failures, information,
- Productivity issues,
- Supplier delivery problems,
- Supplier quality problems,
- Large work-in-progress,
- Long product development times,
- Large people attrition rates,
- Too much time to get data,
- Incorrect data, transaction errors
- Long lead time to prepare financial statement etc..

These are actually trouble areas that indicate opportunities for improvement. Savings are likely to be high, although these may not be captured adequately in the current system. We can imagine that this is similar to an iceberg of **Cost of Poor Quality** (COPQ) where more is hidden below the surface than is visible above. Most organizations do not capture the hidden cost of poor quality.



As example of pain areas is time spent in manual follow up when suppliers do not ship parts in time. When we call them, they inform that the purchase order did not require them ship any quantity! Further investigation shows that our ERP system did not send order as this part was on stock! Thus root cause is likely to be stock inaccuracy perhaps due to transaction errors. If this happened occasionally, we may not need Six Sigma project to fix it. However, if this happens to significant number of parts day-in and day-out, we have a Six Sigma project.

Another approach is to use **Theory of Constraints** (TOC). We need to identify which of the processes restrict us from meeting our goals. Primary goal of companies (in business) is to make profit. In simpler words, TOC aims at identifying bottlenecks in the value chain. Bottlenecks are opportunities for improvement. Unless we address these, improvement in other areas will not give desired results. These bottlenecks could be machines, suppliers, processes, policies that throttle the output. These need to be challenged for improvement.

We can use combination of these or other approaches to identify opportunities for improvement.

No company is actually known to have actually achieved 6 Sigma level i.e. 3.4 Defects per Million Opportunities (DPMO) in all processes. Thus Six Sigma Projects may not achieve 3.4 DPMO level but should achieve breakthrough improvement, typically 50 to 70% improvement over the current level.

Six Sigma projects can be selected carefully considering:

- **Areas of Customer dissatisfaction**
  - Review input data for customer satisfaction surveys, informal inputs, complaints data, market share trends, lost customers, warranty data, service levels
- **Strategic Goals of the company**

  Top management needs to decide priorities for improvement based on customer inputs, business objectives, competition, benchmarking , technology etc.. These could be reduction of cycle time to deliver, improving reliability, reducing inventory, Improving yield, reduce cost of poor quality, reduction in development cycle time, improve equipment utilization, supply chain performance. These become strategic goals for the company. Examples of these could be:
  - Improve cycle time for processing from 20 days to 12 days in one year
  - Improve product reliability by 50 % in three years
  - Improve procurement and planning system to improve inventory ratio in 12 months
  - Improve engineering and materials database accuracy
  - Reduce external defects by 50 % in 18 months
  - Improve delivery performance from 85% to 99.9% in 18 months
- **Areas of inefficiency and waste:**
  - Rework data, number of inspectors doing “sorting”, 100% inspection points, process capability data, handling, long lead times, large work in process, long transaction cycle times
  - Inaccurate databases such as inaccurate stock levels, incorrect bill of material, incorrect process cycle time data, Incorrect customer data base
- **Financial Benefits:**
  - Green Belt projects should have savings of the order of US$ 45-100,000 (approximately Rs. 20 to 50 lacs) and Black Belt projects should generate savings of US$ 100,000 (approximately Rs.1,00,000,00).

Some useful questions for project selection and scope:

- Does the project strongly relate to business goals?
- Does it have significant impact on customer satisfaction?
- Is the project clearly defined?
- Can we expect good savings and benefits?

- Can the project be completed in 3 to 6 months
- Is it too large? (Boiling the ocean!)
- Is it too small?
- Is it too difficult or too easy?

Some examples of Six Sigma Projects:

- Reduce Scrap % of expensive parts from 4% to 1%
- Reduce transaction Cycle time from 9 days to 4 days
- Improve accuracy of bill of material from 94% to 99%
- Improve accuracy of stores from 96% to 99%
- Improve Right First Time of assembly from 66% to 85%
- Reduce Customer defects from 30,000 PPM to 5,000 PPM
- Improve process yield from 75% to 90%
- Improve utilization of lab equipment from 35% to 70%
- Reduce power consumption per unit production
- Reduce product development time from 6 months to 3 months
- Reduce Supplier PPM by 40%
- Improve Supplier Delivery performance from 85% to 97%
- Improve productivity by 30%

Let us take a case to understand the process:

Case for Selection of Six Sigma Projects:

Company XYZ produces machines that are used as major component of industrial equipment. Its annual sales turnover is US$ 250 million. It has a complex product line and makes customizations for customer segments and Original Equipment Manufacturers (OEMs). A third of its products are exported and remaining used in the country of manufacture. The company enjoyed leading position for many years but competition has started showing significant presence now. During customer interactions and surveys, the inputs were:

- Customers are generally happy about product performance and service network.
- They are concerned about lower availability of products due to number of failures.
- They have informed that they prefer XYZ's machines as these are cheaper than competitors but are finding that the cost of machines as a component of total equipment cost is about 15%.
- OEMs find that it takes long time to select machines and launch new models. Competitors are introducing new models constantly.

Other information that may be useful:

- Company spends approximately 3.7% of the sales on warranty of the products
- Inventory turns of the company for the last financial year are 3.5
- Average delivery performance is 84%. Primary reasons for the delivery misses are

    - Parts shortages at the time of assembly
    - Surprises during assembly of machines as some of the specified parts required for customization do not fit.
    - Parts that are shown as available in the information system are actually not available
- 42% of the suppliers are third party certified to IS0 9000.
- Company has implemented ERP system 2 years back and finding it tough to manage the processes using the system

Formulating Six Sigma Strategies:

Key points from customer inputs are:

- Reliability of the products needs to be improved to the extent that customer is willing to little extra for lower failure rates. This is due to the fact that downtime of the equipment is expensive as cost of total equipment is much higher than the cost of our machine.
- New products need to be introduced quickly before competitors

Key points from other information:

- There is a major opportunity to reduce inventory
    - In spite of large inventory, supply chain and/or material management needs to be looked into.
    - Data integrity and accuracy is a major hurdle in relying on information in the computer system. This can impact many performance measures such as inventory, delivery performance etc.
    - Excess and obsolescence management needs improvement.

Having identified the strategic areas for improvement, top management should facilitate and lead project selection process. Each of the strategic improvement area can result in more than one project. Some examples of improvement project short charters could be:

- Improve delivery performance of one market segment from 84% to 95%
- Reduce cycle time to launch new products from average 15 months to 7 months
- Improve mean time to failure (MTTF) of pumps from 3600 hours to 5000 hours
- Improve accuracy of Engineering specifications from 92% to 99%
- Improve accuracy of stores from 90% to 97%
- Improve mean time to repair (MTTR) from 57 hours to 30 hours (caution: maintenance time may not be normally distributed. Appropriate transformation may be required)

Summary:

Organizing for Six Sigma Projects and project selection are critical for success of Six Sigma. Involvement of all functional heads is necessary to make Six Sigma a companywide improvement initiative. Senior management need to ensure that

projects are linked to strategic goals of the company to get maximum benefits from Six Sigma.

About Author:

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