

ASSESSMENT OF DESIGN FOR SIX SIGMA AND NEW PRODUCT DEVELOPMENT IMPLEMENTATION

Many companies have a formal new product development process. However, most companies do not use these processes effectively. In a global economy, companies are looking for organic growth with differentiated new products that will provide them with the competitive edge. In addition, products are getting more technology intensive, and informed consumers and customers are demanding high consistency and quality. Integrating technical rigor, quality standards and effective data management (Design for Six Sigma) into the product development process is also a necessity. Several studies and surveys continue to indicate the dissatisfaction of upper management and CEOs with their new product development process and pipelines. Those companies that have sustained their growth over time have some very common best practices. These best practices are common across all types of industries and products.

Successful implementation of Design for Six Sigma and New Product Development involves best practices in the following areas

- **Management**
- **Infrastructure**
- **Teams and Resources**
- **Metrics**

Management

Product development and Design for Six Sigma (DfSS) involves every single function and all levels of the organization. Every employee affects customer value creation with respect to the organization's products. It is imperative that management understands this and provides the commitment, leadership and strategy. Not only do they need to be champions of the defined process and initiative, they also need to be engaged and involved from strategy to decision making. One of the biggest areas of failure in organizations is when the upper echelons of management do not understand or believe in the process, and are not actively involved in it. If this does not happen, management has the tendency to strike out on their own and completely change or alter the process, strategy or direction leading to complete failure and low employee morale. Results for new product development do not occur overnight. It is important that management be committed to the process for 2 to 3 years to start seeing benefits.

Management Best Practices:

Successful companies that sustain organic growth and revenue through new products and customer value, have management that is constantly engaged and involved in strategy, the process and decision making.

Management

- Commitment
 - o Management must make a long term commitment in order to ensure sustainable success of the product development process. Typically, this means implementing, assessing, improving, and refining the defined process methodology. Benefits are typically realized in 2 - 3 years.
- Leadership
 - o Management must lead by example. They must be champions of the process. They must communicate the vision, strategy and benefits of the process to the entire organization.
- Engagement
 - o All levels of management must be integrally engaged in, and participate in the product development process. They must adhere to the defined and agree-upon process without changing it at their whim and fancy.

Infrastructure

A customized, organization-wide, standardized product development process is one of the most important parts of the infrastructure. This product development process must be tailored to the organization's core values, processes, types of products and the type of industry or market they play in. One of the most common mistakes that companies make is to take a turn-key product development process from another organization or consulting group and force-fit that process into their organization. This methodology has never worked. The same problem solving methodology (Six Sigma, PDCA, etc.) can be used as-is within any company. A product development process however, differs from company to company and thus, must be customized.

The standardized process must be used as an effective communication, project management and risk management tool. The benefits of a standardized process enable companies to be flexible and responsive in meeting the changing needs of the customer and the market. To that end, the process must have a customer or market focus where product development is based on validated technologies and platforms. The process must include go/no-go decision points through the product development cycle to assess risk, probability of success, value, financials and plans based on predetermined deliverables and metrics.

The entire product development process should be reviewed at regular intervals to see what works and what needs improvement within the organization. Continuous improvement must be embedded into the process.

Infrastructure Best Practices

Best-in-class companies have a standardized, rigorous, data-driven product development process. Software packages enable companies to communicate effectively, assign

resources and tasks, bring transparency and accountability to the process and facilitate effective communication and knowledge management.

Infrastructure

- Standardized New Product Development Process
 - o Formulate an organization-wide standardized product development process, tailored to their products and industry. The process must have well defined stages and gates (decision points), with clearly defined activities and deliverables.
- Effective Communication
 - o Establish a climate of open communication across all functions and up and down all management levels. This must include communication with customers and suppliers.
- Collaborative Software
 - o Use collaborative software solutions that enable the tracking and management of new product development projects. Appropriate product development software, customized to the company's needs can help with project tracking, responsibility, accountability, visibility and knowledge management.
- Continuous Improvement
 - o Companies must establish a continuous improvement culture. This includes assessing and reviewing the product development process effectiveness, setting benchmarks and improvement actions on a regular basis.
- Customer and Market Focus
 - o Establish a customer and market driven product development process. Projects must be selected on sound data and market intelligence analysis for commercialization success. The portfolio must include short-, mid- and long-term projects.

Teams and Resources

Cross-functional teams that work well together from concept through commercialization have the biggest chances for success. Market and customer requirements typically come from the marketing and business teams. Customer requirements are translated into product performance characteristics and are developed by the technology and engineering groups. The finalized product goes into full scale production in manufacturing and is sold by the sales, technical service, marketing and customer service departments. Many other functions touch the product during its development stage including legal, environmental, purchasing and testing. If all these functions do not work together and communicate with each other, there could be significant delays or failures. This is one area that many companies struggle with. Very few have the systems, procedures, process and leadership in place to bring these different functions together through the product development cycle. Most companies work via a hand-off process, that ultimately costs the

organization time and money due to inadequate communication resulting in waste and ultimately the wrong product.

Successful companies do away with bureaucracy and provide responsibility to teams to make decisions. The teams are also held accountable for those decisions including accountability with project deadlines and budgets. Such practices allow for speed and flexibility.

Part of the overall product development strategy is to assign the right resources to the right projects. This can only be done if an organization understands their product development project portfolio, and the project priorities and risks. Upper management and business teams must be involved in effective resource management and have the ability to divert resources to the most important projects based on priorities and needs. Resources must be reviewed on a periodic basis.

Effective project management and communication is also critical to success. T-type communication and involvement alludes to the Toyota process where the vertical line in the letter T symbolizes communication and involvement up and down all levels in the organization, and the horizontal line in the letter T symbolizes communication and involvement across all functions in the organization.

Teams and Resources Best Practices

Best-in-class companies assign the right resources to the right projects based on project priorities and risks. Successful organizations that consistently develop successful new products and bring sustained value to their customers always involve cross functional teams working together from concept through commercialization.

Teams and Resources

- Resource Management
 - o Ensure that management is involved in allocating and approving resources for projects. This includes reviewing projects at defined frequencies to allow for flexibility and change.
- Cross Functional Teams
 - o Establish a culture where development teams are cross-functional from concept through commercialization. These teams must work with and communicate effectively throughout the process.
- Empowerment
 - o Product development teams must be empowered to make important decisions and be accountable for the results and performance. Bureaucracy must be avoided and flexibility must be encouraged.
- Skills and Training
 - o Ensure that product development teams have the appropriate skills and training. This includes training on the product development process, project management and any other relevant skills.

Metrics

No organization can be successful if they do not set goals and metrics to measure themselves against. New product development metrics should include product performance standards and quality levels based on the customer or market requirements. The quality metrics should be based on the six sigma principles. In addition to standard quality metrics, financial metrics must also be included. Such metric can include Net Present value (NPV), Internal Rate of Return (IRR), growth, revenue and profitability metrics.

To evaluate the product development process itself, metrics like the vitality index, product development cycle times and tracking projects that meet timelines and budgets can be used. Such metrics will help with the continuous improvement.

Metrics Best Practices

Evaluation of product quality and performance based on customer specifications.
Evaluation of profitability and revenue. Evaluation of the product development process itself.

Metrics

- Quality Metrics
 - o Establish quality metrics and targets based on six sigma principles, risk and criticality. This includes the use of critical parameter management.
- Financial metrics
 - o Project selection decisions and outcomes must use rigorous financial metrics. Project results must also be evaluated based on revenue and profitability.
- Organic Growth Metrics
 - o Companies must set aggressive targets to assess organic growth, their success at commercializing, selling and sustaining new products.
- New Product Development Process Effectiveness Metrics
 - o Establish appropriate metrics to assess the new product development process. These metrics could include development cycle times, assessing projects that are on time and on budget etc.

Level 1

- **Management**
- **Infrastructure**
- **Teams and Resources**
- **Metrics**

Level 2

Management

- Commitment
- Leadership
- Engagement

Infrastructure

- Standardized New Product Development Process
- Effective Communication
- Collaborative Software
- Continuous Improvement
- Customer and Market Focus

Teams and Resources

- Resource Management
- Cross Functional Teams
- Empowerment
- Skills and Training

Metrics

- Quality metrics
- Financial metrics
- Organic Growth Metrics
- New Product Development Process Effectiveness Metrics