A Management Control Prospective of Quality Management

Meet Bakotia
bakotia.meet@gmail.com
H402 Aakruti Elegance, Opp Global international school, Godrej garden city Ahmedabad, India.

&

Krushankant Jani
Krishnkant.97@gmail.com
D-001, Foram appartment, b/h vishwakarma temple, Chandlodia, Ahmedabad, India.

Abstract

In manufacturing industries across globe manufacturing complexities have unpredictably increased over the last few years. The reason is increasing varieties of products and shortening product life cycle. At the same time the manufacturers in these industries appear to have more problems with maintain high quality levels. This paper aims to develop a methodology to study the effect of these developments on quality management systems.

Key words: Risk Evaluations, Public Private Partnership

Introduction

Increasing product variety and shortening product life cycles has significant impact on the increasing complexities and uncertainties in an organization. Companies are now days increasing number of different products and along with that have to introduce new versions of all these products, make complex and unpredictable environment. (II, 1993) Reasons for these complexities are different processes which require continuous management attention. To manage single mass production process is always easy than to manage multiple production processes with large product varieties.

The unpredictability is caused by the constant flow of new varieties of product introductions and product updates. The success remains in the business until your competitor launches the new verity in the market. Business environment is the combination of predictability, stability and instability. Shortening product life cycle and increasing product variety are leading many firms towards more instability and unpredictability. As per the survey carried by quality expert, there is need of radical change in the quality management and quick response to fluctuating demand will be the single most important challenge of the future for quality management (Mehra, 2001).

To study the effects of shortening product life cycle and effects of increasing product variety on quality management, a new model is required which can be simple and stable along with can handle unpredictable and complex environment. As per the literature review, it can be conclude that quality management consist of three core blocks includes Customer orientation, Process controls and Continuous improvement (J.W. Dean, 2014).

Based on these, it can be argued that quality management can be seen as a control system as all building blocks aim to handle and control an organization’s processes and to improve and change these processes in response to changes. Therefore, a logical place to look for a model is in the field of management control.
1. **Background of Study and Literature Review**

**MANAGEMENT CONTROL**

A model which can control and can distinguish between simple and stable environment, and complex and unpredictable processes, is Simon’s Four Levers of Control Model (Simons, 1995). The model shown in Figure one, used to balance control mechanism in an organization in order to design business strategies more rigid and concrete. It explains four different types of control mechanism: Belief system, interactive system (increases individual freedom) and Boundary system and Diagnostic Control system (to restrict individual freedom).

![Figure 1: Simons’ four levers of control model](image)

1.1. **Beliefs systems**

It is used to direct and inspire the search for new opportunities. A beliefs system is the explicit set of organizational definitions that senior managers communicate formally and reinforce systematically to provide basic values, purpose, and direction for the organization (Simons, 1995).

1.2. **Boundary systems**

It’s used to put limits on opportunity seeking behavior. Boundary systems delineate the acceptable domain of activity for organizational participants. Boundary systems do not specify positive ideals; instead they establish limits, based on specific business risks, to opportunity seeking.

1.3. **Diagnostic control systems**

Diagnostic control system is used to monitor, motivate and reward achievement of specified objectives. It manages the formal information systems that managers use to monitor organizational outcomes and correct deviations from set standards of performance. Three features comprise diagnostic control systems: (1) the ability to weigh the outputs of a process, (2) create predetermined...
standards against which actual results can be compared, and (3) the ability to monitor and correct deviations from standards.

1.4. Interactive control systems

It is used to stimulate organizational learning and the new strategies and ideas. It is a formal communication system, managers use to involve themselves regularly and personally in the decision activities of peers and subordinates.

<table>
<thead>
<tr>
<th>Control System</th>
<th>Purpose</th>
<th>Communication</th>
<th>Control of strategy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Belief System</td>
<td>Empower and expand search activity</td>
<td>Vision</td>
<td>Perspective</td>
</tr>
<tr>
<td>Boundary System</td>
<td>Provide limits of Freedom</td>
<td>Strategic domain</td>
<td>Competitive position</td>
</tr>
<tr>
<td>Diagnostic System</td>
<td>Coordinate and monitor the implementation of Intended strategies</td>
<td>Plans and goals</td>
<td>Plan</td>
</tr>
<tr>
<td>Interactive System</td>
<td>Stimulate and guide emergent strategies</td>
<td>Strategic uncertainties</td>
<td>Pattern of actions</td>
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Table 1: Relating the four levers of control to strategy

Any control system in an organization can be classified on the basis of this model where four different types of control systems work together to realize the business strategy. To make this happen, there must be a balance between the different types of control systems. If the focus is on only one or two types of control systems, the organization may face difficulties in realizing its strategy.

In the current scenarios the two trends of shortening product life cycles and increasing product variety bring about complexity and unpredictability for many organizations. The same reasoning also applies to specific control systems, like quality management. Therefore, quality management systems can also be classified according to the four levers of Simons’ model. So, a shift is expected from diagnostic quality management systems to interactive quality management systems.

2. Research Methodology

To study the effect of shortening life cycle and manufacturing complexities, three case studies have been conducted at Indian automotive manufacturers. Because of the explorative nature of this research, a case study approach is a suitable methodology (R.K. Yin, 2003). The interview has been held in both organizations with the production manager, supply chain manager, logistics manager, quality manager and human resources manager. Along with that few relevant first level suppliers have been selected. Interviews were held with the account manager for the Indian automotive manufacturers (in some cases together with the quality manager of the supplier).

All interviews were conducted by three interviewers and each interview took around 2 and 3 hours. Those were focused at the changes in management systems that have taken place over the last ten years in the field of responsibility of the interviewee. Each interview was written down by both interviewers and, based on these two write-ups; a final write-up of the interview was produced. The issues and scenarios were presented to the interviewees during a meeting in which these managers could express their opinions and perceptions.
3. Data Analysis and Interpretation

The results of the case studies at the three Indian automotive manufacturers have been examined and interpreted by means of the Simons model by placing the required quality management issues and process developments in the four levers. It means that all issues and/or developments have been judged by a group of academic quality experts and positioned in one or more levers of the Simons model. Figure 2 shows an example of developments and issues in the area of process control. The figure indicate the linkage and the flow of process. Top level indicates that the development that has already happed and the bottom level indicate the final outcome of the process.

Figure 2: An example of developments and issues in an Indian automotive manufacturer’s process control

The importance of the supply chain has increased over the years for this manufacturer. Along with that, there have been changes in the management and control of the quality of the suppliers. Few years ago manufacturer used incoming inspection to measure the quality of the products that were delivered by its suppliers. So the used system was a diagnostic control system as it measured the compliance to...
preset quality standards. When they have realized the time and resource consuming this policy was, they started to proceed towards quality assurance by means of ratings and supplier assessments. On a day-to-day basis the quality performance of each supplier is monitored and recorded in a database. Those ratings were used in the decision process of suppliers that takes place when new supply contracts will be given to suppliers. This is again a diagnostic in nature as it uses predetermined performance measures that lead to a ranking of suppliers.

Now days, a development has been started towards co-development between manufacturer and their suppliers. This shows that there is discussion and communication between the suppliers and manufacturer about new product developments. So, the manufacturer shows its plans for future products to its suppliers and it asks them to comment on the plans to tackle possible quality problems whereas the product is still in the design phase.

In an interactive way, the manufacturer discusses its new designs with suppliers and uses their experience to improve the design. So it becomes clear which levers were important at what moment in time as the sequence of developments in time is known. It indicates which levers needs and receives the most attention at a certain point in time. It becomes clear from figure 2 that the supplier focus has shifted over time from the right side of the matrix i.e. diagnostic control systems towards the left side i.e. interactive control systems.

Figure 2 also shows that two levers of the Simons model receive no attention. The reason for this may because there is no quality management system in place that controls the suppliers from the perspective of these two levers. The absence of certain levers in the management of the quality of the manufacturer’s suppliers can be understood from the figure 2, which allows managers to think about the consequences of missing levers. The example has no boundary system. Apparently top management thinks that such boundaries are not necessary because the ranking systems that are in place ensure that only the best performing suppliers are awarded new contracts.

Therefore, it may not be necessary to define minimum quality levels. However, the boundary systems do not only define minimum levels of quality but also maximum levels. In the automotive industry products need to last only for a limited number of years, so it is not necessary to manufacture car parts that last for ages. It may be wise for automotive manufacturers to determine the relationship between the technical lifespan of a car part and its costs. If the costs go up if the technical lifespan is increased, the manufacturer should question whether it is really necessary to go for the highest quality car part with the longest lifespan. Based on the example in the previous paragraph, it can be argued that the presence of quality management issues and their developments over time in relation to the different levers of the Simons model may give an indication of the quality maturity of the organization. So, if a company has quality management systems in all four levers of the Simons model, it may be more quality mature than a company that does not have quality management systems in all four levers.

4. Conclusions

In the current business environment the two trends of shortening product life cycles and increasing product variety may have an impact on quality management of firms. This paper argues that the influence of the two trends is experiencing by automotive sector. The research shows the way the Simons’ four levers of control model can be used to identify and categorize quality management issues and helps in indicating the direction in which changes are needed. The research has explained a novel application of Simons’ four levers of control model to the field of quality management. This approach seems to have potential based on the experience with three case studies at Indian automotive manufacturers. However, the methodology that has been used for this research needs to be developed further to improve its usefulness for scientific research and practical application.
5. References