The case study of toyota

Through the case study of Toyota we shall understand the concept of operations management better and comprehensively. Before analyzing the operations of Toyota let us know more about the company. Toyota Motor Corporation is Japan’s leading carmaker. The company has international existence in more than 170 countries across the globe. It manufactures a variety of automobiles including cars, pickups, minivans and SUVs including models such as Camry, Corolla, 4Runner, Land Cruiser, Sienna, the luxury Lexus line, and full-sized pickup trucks. It has enormous financial potency, a sales turnover of 131, 511 million for 1997 and sales growth of 29. 3%. It is the second largest car maker in the world, following General Motors. Some of the key points of its success include:

1. Successful Brand:
2. Toyota has gradually developed into a trusted brand based on quality, first-class performance and for being eco-friendly. (Lysons & Farrington 2005)
3. Innovation
4. Toyota is at the front position of car manufacturing innovation. It was the earliest car maker to embrace lean manufacturing (called Toyota Production System) which is a quicker, more competent process which leads to a lesser amount of waste compared to the conventional batch and queue technique of manufacturing. It in addition applied JIT (Just in Time manufacturing) and smart automation.
5. Product Development
6. Answer to the achievement in the car market is latest models which encourage demand and loyalty to the Toyota brand. Toyota has status

for producing cars which are greener, more fuel proficient, and of first-class performance. Toyota has sought after to meet government necessities like reducing the impact on the atmosphere, economic changes including prices of fuel – oil persisting to increase by developing of hybrid fuels. Toyota was the earliest car maker to promote hybrid (gas and electric) fuel, with the commencement of Prius model, earlier than its rivals.

7. It effectively entered markets and penetrated them with both manufacturing and sales subsidiaries. Toyota easily gained first mover advantages by existence in internationally strategic markets (Asia, Europe, US) first, whereas it’s closest opponent (Ford, GM) gained grip in only 2 of (US and Europe). Toyota is well positioned to take lead of the development in South East Asian markets of China and India.
8. Toyota has stimulated to a worldwide manufacturing model. Car manufacturing sites are costly, requiring high fixed cost investment. Toyota has moved its manufacturing site to where factor costs are lesser (with no comprising on quality) and currently manufactures diverse parts of the car and carries out assembly in diverse locations around the globe It has been mainly flourishing at gaining cost efficiencies and compared to the manufacture and assembly of cars in single location.(Management of technology and innovation in Japan, By Cornelius Herstatt, Hugo Tschirky, Christoph Stockstrom)
9.

Major challenges and future outlook for the company:

- Car manufacturers are constantly facing increasing political and consumer group demands to manufacture cars that are more fuel-efficient and decrease emissions.
- Saturation, over supply in the developed world, has led producers to look to China, India and up-and-coming markets where population, income and demand is mounting. However, these countries have national brands which are increasing in reputation.
- Oil prices – upsetting the price of fuel.
- Consumers handling of cars are declining. Faced with increased operation costs, consumers are reported to be using their vehicles less to bank on household costs. Governments across Europe are encouraging car-share and substitute forms of transportation. These factors are disturbing the demand for latest cars.
- Varying demographics: The size of families has been declining. This has condensed the demand for bigger cars, and an upswing in demand for fuel proficient smaller cars.

After understanding about the company along with its problems and solutions we shall study in detail about the operations management of Toyota Motor Corporation. As we are already aware that automobile industry is huge and is popularly split into two categories namely, commercial vehicles and cars. Even as General Motors' is the world's largest automobile producer, the situation of car market is rather different due to sudden changes stimulated by Japanese counterpart Toyota racing ahead. Recently, Toyota has gained world's leading car manufacturer label having about 17%

market share, followed by GM and Ford who have approximately 15 and 12 per cent market share, respectively. (Toyota Culture, By Liker)

- **Processes under consideration for Toyota Motor Corporation**

Operations are the second pillar supporting production activities. As already studied above, operations are associated to the flow of equipment and operators. Improvements in operations management has been long emphasized in the Toyota production system. Operations have three fundamental components preparation and after-adjustment, principal operations and marginal allowances. (Shingo & Dillon 1989)

These are known as setup change operations which generally take place before and after the production of every lot. They are considered useful operations in the company. Earlier majority of the production took place in large lots because setup changeovers took a lot of time. Under those situations, producing in larger lots resulted in lower labor costs however it also caused an undesirable upscale in in-process stock.

- **SMED setups**

The fundamental assumption behind the economic lot size, although is the sudden reductions in changeover is quite impractical and impossible. The development of SMED setups has led to the collapse of this assumption and the requirement for such economic lots to disappear. Making use of SMED to reduce setup times is usually regarded as a means to enhance the operating rates of machines without any doubt. It must not be forgotten, that greater profits are gained by application of SMED to process enhancements like using smaller lot production to eliminate stocks or getting rid of finished product inventories through the usage of rapid changeovers for order-based

production. The second element of operational improvement understands of the concept of standard operations. In this section of our paper we shall completely explore this concept existing within the Toyota production system and its three temporal aspects.(Just-in-time for operators, By Prod Press, Productivity Press Development Team)

- **Standard operations and the Toyota production system**

Standard worksheets and the data contained in them are essential aspects of the Toyota production system. For any production personnel to be able to write a standard work sheet that is understandable by other workers, requires being self convinced by its importance. The company has eliminated waste by analyzing available resources, improving machining processes, installing autonomous systems, improvising tools and optimizing the quantity of materials available at hand. At the same time high production efficiency should also be maintained by putting an end to recurrence of defective products, operational mistakes and accidents and by encouraging worker's to present their ideas.

By maintaining a standard work sheet efficiently Toyota to a great extent could keep a track on its production system and was able to eliminate any type of wastages or obstructions. A standard work sheet competently combines materials, workers and machines to manufacture effectively. In Toyota, this process is known as work combination which is a result of standard work procedure. The list clearly enlists three aspects of the standard work procedure as:

2. Cycle Time
3. Work Sequence

4. Standard Inventory

Cycle time is the time which is allotted to manufacture one piece or unit. This is determined by the production quantity, which means the quantity required and the operating time. Quantity required per day can be calculated by quantity required in a month divided by the month’s number of operating days. In majority of the cases, delay takes place due to the differences in the operator motion and sequence. The job of the field supervisor, section chief is to effectively train workers which is possible through clear instruction sequence.

Standard inventory refers to the minimum intra-process work-in-progress required for operations to take place. In Toyota production system, the condition that parts have to reach just-in-time implies that standard inventories need to met more meticulously. With the inclusion of “ just” in “ just-in-time” it means that if the parts arrive any time earlier to their requirement and not at the time when it is needed actually, then wastage cannot be eliminated. In Toyota production system, overproduction is entirely prevented by kanban. Consequently, there is no requirement for additional inventory and thus no requirement for warehouse and its manager. (Lowson 2002)

- **Operations Management and its Theory**

For any business organization, the value added by both operations management and operations strategy is fundamental and basic. The operational activities are fundamental to the provision of goods and services. Every organization offers a product and service combination. Eating a meal in a restaurant, purchasing a pair of Pepe Jeans, insuring an automobile; all

have operations activities and their management is vital to the successful provision of goods and services. Operations management has its roots in the study of “ production” and “ manufacturing management”. Definition of operations management can be put across in the following words, “ The design, operation and improvement of the internal and external systems, resources and technologies that create and deliver the firm’s primary product and service combinations (Ramsay n. d).”

To the extent organization structure is concerned, a few firms would have discrete operations function. It might be called a manufacturing department, an operation system or have no recognizable name itself. Although, it is a fundamental and essential function similar to marketing and accounting having professionally skilled operations or products manager. In different organizations these managers shall have different titles, a store manager for a retailer, distributions manager in a logistics company and so on.

According to the definition above, operations management is a concept which extends beyond the limits of internal production or manufacturing. Currently, it encompasses other additional activities including purchasing, distribution, product and process design, etc. Additionally, there would too be external managerial responsibilities at a supply network level which covers a large number of interconnections amongst external firms. (Betz, 2003).

It is seen that the study of operations management and operations strategy is comparatively newer discipline, when compared with a lot of social and natural sciences. In the definition of Operations management we made use of the term “ Product and Services combination” which is an important point

to be noted. The type of products or services has significant implications for operations management and operations strategy. Another important point is that in operations management goods and services are two distinct activities.

Organizations undertaking different diverse activities in providing variety of products and service often have many suppliers and customers. The concept of flexibility plays an important role operations management and it is a subject exercising the minds of many managers in today's modern organizations. The analysis of any operational activity is not a simple task as there are several important techniques which help the process. (Hutchins 1999)

- **Value Adding**

Value added is basically associated with how well an organization matches its product and service combination to the identified needs of its selected customers. Michael Porter (1985) comments, " In competitive terms, value is the amount of buyers is voluntarily paying for what a firm provides them. Value is measured by total revenue, a reflection of the price a firms' product commands and the units it can sell. Creating a value for buyers that exceeds the cost of doing so is the goal of any generic strategy (Ramsay n. d)."

Usually a single firm would not take up all these primary and secondary activities. As it is a known fact, firms are increasingly becoming reliant upon others in their supply network.

- **Kanban**

With an enhanced tool, we could be able to achieve wonderful outcomes. But if it is used wrongly, then this very tool can make things worse. Kanban is

amongst those tools which is used incorrectly could lead to a number of problems. To correctly employ Kanban, we need to firstly understand its role and then subsequently establish the rules for its usage.

Kanban is a technique to achieve just-in-time; its aim is as the name suggests just-in-time. Kanban, in true sense becomes the autonomic nerve of the production line. In this, production workers begin to work themselves and make their individual decisions regarding overtime work. The kanban system also clarifies what should be executed by managers and supervisors. Thus, it promotes improvement in both work and equipment. The objective of elimination of wastage is too highlighted by kanban. Its implementation demonstrated what is waste, allowing creative study and enhancement proposals.

- **Complete Analysis of Waste**

While thinking about the absolute elimination of waste, the company has to keep two things in mind:

- Improving efficiency can make sense only when it is linked to cost reduction. To be able to achieve this, Toyota has to begin producing only those items which use least manpower.
- Consider the efficiency of every operator and of every line. Then take a look at the operators as a group and subsequently at the efficiency of the whole plant. Efficiency requires to be enhanced at every stage and at the same time for the entire plant.

By successful elimination of these wastes shall entirely enhance the operating efficiency by a wider scale. To accomplish this, Toyota must make only the quantity required, thus eliminating surplus manpower. The company's management is responsible to recognize excess manpower and use it efficiently.

- **Total Quality Management:**

TQM is a group of management customs throughout the business, geared to make sure the organization constantly meets or exceeds customer necessities. TQM places strong concentration on process measurement and controls as way of constant development. A complete, organization-wide attempt to develop the quality of products and services, appropriate to every organization. Through the implementation of TQM, senior management will authorize all levels of management, together with self management at worker level, to handle quality system.

TQM focuses on:

5. Focuses on constant development.
6. Recognizes responsibility of everybody in the business.
7. Views business as an internal system with a concentrated aim.
8. Focuses on the means responsibilities are accomplished.
9. Emphasizes on joint effort.

Direct benefits of TQM are as follows:

10. Amplified satisfaction of workmanship amongst individual workers
11. Improved willingness.

12. Enhanced sustainability caused by extended time among equipment failures

- **Comparison of Theory with Practice**

Value Adding

Value chain analysis could be utilized to describe the activities within and around the Toyota and associate them to the competitive strength of Toyota i. e. the capability to offer value for money products and services. Therefore, the approach is based upon the requirement to recognize separate organizational activities and examine their value added. Different resources including people, machinery, information etc. should be deployed into activities, routines and systems which produce the requisite value. (Liker & Hoseus 2008)

Primary activities:

13. Inbound logistics: Receiving, storing and distributing the inputs to Toyota
14. Operations: Transforming inputs into outputs.
15. Outbound logistics: Storing and Distribution and delivery of product and service combinations. (Lowson 2002)
16. Marketing and sales: A means through which consumers are made aware of and can buy automobiles.
17. Services: It includes those activities which improve the value of a automobile.

Support Activities:

18. Procurement: It is the process of acquiring the resource inputs to all the different primary activities across the entire company.
19. Technology development: All the activities are performed with the help of technology which includes know-how and knowledge, whether concerned directly with products or services or processes.
20. Human Resource management includes all those activities like recruitment, managing, training, developing and reward system.
21. Infrastructure: This includes the broader aspect planning, finance, quality control and information management.

Kanban and its usage in Toyota Production Line

Within a production plant, kanban is a powerful force to decrease manpower and inventory, elimination of defective products and preventing recurrence of breakdowns. Market diversification in Toyota can be seen through the variety of cars, SUVs and commercial vehicles it manufactures.

To illustrate, considering Corolla, the world’s largest mass-produced car during the late 70’s, a definite production plan can be set up on a monthly basis. The total number of cars needed can be divided by the number of working days (which is the number of days on which actual production could be carried out) to the level the number of cars to be manufactured in a day. By studying each process like this, we could keep diversification and production leveling in harmony and still respond to customer orders in a

periodic manner. Kanban enhances productivity and always moves with the required goods and thus becomes a work order for every process. In this manner, a kanban can easily stop any kind of overproduction, which is the largest loss in production for any company including Toyota.

To make sure that Toyota has 100% defect-free goods, they set up a system which automatically informs them if any process generating defective product is identified. Processes in Toyota mostly require just-in-time system which doesn't require any additional inventory. So, if the earlier process is generating defective parts, the subsequent process should stop the line. Additionally, everybody sees when this took place and the defective part is returned back to the previous process. Until such kind of defective work is decreased, it becomes complicated to assure a sufficient supply for the subsequent process to withdraw or to accomplish the aims of producing as economically as possible. An effort to thoroughly stabilize and rationalize the processes is the solution to comprehensively implement automation. (Betz 2003)

Complete Analysis of Waste

During 1950 labor dispute over manpower reduction and the ensuing business boom of the Korean War, Toyota struggled with a problem of how to scale up its production without increasing its manpower. The product manager came up with an idea and following means. For instance, one production line consists of 10 workers and manufactures 100 products yearly. This implies the line capacity is 100 pieces every day and the productivity per individual is 10 pieces a day. Examining the line and workers more in detail, one notices overproduction, workers waiting and other

unnecessary movements depending upon the time of the day. If we try to enhance this situation and reduce manpower by 2 workers. The fact that 8 workers could produce 100 pieces every day suggests that Toyota could easily grab up to 125 pieces every day, increasing efficiency with no need of decreasing manpower. However, even earlier the company could manage the same efficiency but it was getting wasted due to unnecessary work and overproduction. This implies that if Toyota regards only work which is required as real work and defines rest as wastage, the equation given below holds true for both individual as well as the entire product line:

Present Capacity= Work + Waste

True efficiency improvement can take place only when there is zero waste and bring the percentage of work to 100%. As in the case of Toyota production system, they must manufacture only the quantity required, manpower should be reduced to trim excess capacity and the match needed quantity. (Lysons & Farrington 2005)

The initial step in the direction of application of Toyota production system is to recognize wastes entirely:

22. Waste of overproduction
23. Waste of time on hand (waiting)
24. Waste of transportation
25. Waste of processing
26. Waste of stock in hand (inventory)
27. Waste of movement
28. Waste of manufacturing defective products

Total Quality Management

As already known, Toyota is famous across the worldwide market for automobiles and a number of studies done earlier emphasize the importance of linkage between quality and profitability. Profit margin can be altered by either commanding premium price in the market or decreasing the production cost. One of the most important aims of quality management is to satisfy customers which shall automatically lead to increased market share through more sales. Toyota has become number one car maker and its success is based on reputation of high quality. Cost reduction has been amongst the primary reason for Toyota to adopt TQM. Furthermore, cost cutting and improving the efficiency could focus on managers who are not very successful in implementation of TQM. Initially high quality costs would be higher for the management but over a period of time this application of TQM could decrease the costs. Those companies other than Toyota which focus on TQM are able to concentrate on errors. Toyota Production system needs that what, when, where, why and how questions must be asked and answered for each of its defects. This helps in improvising their quality and reducing errors to the least minimum. (http://docs. google. com/viewer? a= v&q= cache%3AFyNsRG5iRWEJ%3Awww. delhibusinessreview. com %2Fv8n1%2F5. pdf+TQM+toyota&hl= en&gl= in&sig= AHIEtbQStbbXQCHIKERt25d6KsGCNNjpMA&pli= 1)

- **Impact of quality on Customer satisfaction**

Toyota has successfully retained its number one ranking in the car market because of adapting to the practice of " lean thinking" which is not just limited to products and manufacturing processes but also to relationships with its customers and work force. Toyota has successfully marketed itself

and through its activities which need product design, customer relationship building, technical service support for vehicles, brand development, and advertising and sales promotion capabilities. All this has led to a large customer base for the company which has helped it achieve its ranking in the market. Quality has been its key aim and it has already been studied earlier in the paper. Customers wish to get good quality products and Toyota successfully accomplishes its objective.

- **Recommendations for improvement**

As the paper comes to an end I shall quickly run through the principles of success adopted by Toyota Motor Corporation to become the world's largest car maker.

Successfully adapting to Technology

In industry presently, the most important keyword is Flexibility. Everyone wishes to be as flexible as possible and Toyota is no exception. Initially, the factor allowing Toyota to compete with global players was its flexibility. For the company, flexibility doesn't imply pushing the latest and most recent technology onto its current operations and struggling to adapt to such changes. Make use of only thoroughly tested and verified technology which not only serves people but also the processes. Here again testing involves both existing technology and fresh or cutting edge technology which Toyota has comprehensively evaluated and proved that it is functional. (Lowson 2002)

1. Individuals drive continuous enhancement

Toyota has right from the beginning invested in people and in return obtains committed and loyal associated who come to work every day and on time

and are constantly enhancing their operations. The company followed the principle of developing exceptional persons and teams who followed company's philosophy by first glancing at the system dynamics of the organization. Building excellent team who understands and backs the company's existing culture is simply not a matter of adopting trouble-free solutions or a reflection of applying motivational and inspirational theories. The backbone of management approach is to train exceptional people and building individual work groups with successfully integrated social system with the technical system.

2. Look out for solid partners and grow together

Initially when Toyota begun building automobiles, it didn't have the requisite capital or equipment for building the collection of components needed to build a car. Toyota accomplished this after hunting for reliable and dependable suppliers and entered into partnerships with them. During the initial stages company didn't not have sufficient volumes to offer a lot of business to its suppliers. So it offered its partners with the opportunity to grow their business mutually and benefit together. (Lysons & Farrington 2005)

The company has grown gradually by keeping up to its principles and standards into a successful and well-liked car manufacturer across the globe. Through this paper we have comprehensively studied the operations of the Toyota Motors Corporation and also better understood the concept of operations management and its importance in business organizations.

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