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Answer Paper	
SCMPE	Duration: 75
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ANS 1:-

(i) The Various Primary Activities of Audio Tech in its Value Chain Analysis

Michael Porter describes the value chain as "internal processes or activities a company performs to design, produce, market, deliver and support its product! Rather than looking at costs as per accounting cost pools, the value chain model focuses on the work flow of an organization in the form of discrete set of activities that are linked to each other. The value chain model is a generic model that examines activities as Primary Activities and Secondary Activities. Passing through each activity, the product or service gains some value. The idea is to

(a) eliminate non-value adding activities and (b) identify product differentiating or cost leadership opportunities among the value adding activities.

Individual activities reflect the company's strategy, implementation of its strategy and underlying economics of the activities themselves.

Profit margin for the company = Value created less the cost of creating that value

Primary activities are those activities that enable inputs (raw material) to be transformed into output (finished goods) or in the provision of service. Primary activities as per Porter's model are:

Inbound Logistics

Activities related to receiving, storing and distributing the inputs (raw materials) to the production process.

Audio Tech has its materials and components needed to manufacture audio equipment delivered to its godown at the factory premises. These materials are stored until needed for production and assembling at the factory. These are the inbound logistics related activities.

Operations

Activities involved in transforming raw materials into final products,.These would include machining, packaging, testing and equipment maintenance.

Audio Tech's work flow activities related to manufacturing of the audio equipment and components need to be considered here. In addition, the testing of equipment using ipad application, bass sweep test as also sound quality check after assembly into the car, are operations related activities.

Outbound Logistics

Activities involved in collecting, storing and distributing the products from the assembly line to the end user customers. This includes finished goods warehousing, delivery vehicle operation, order processing and scheduling.

Some of the activities that would be classified here are:

- (a) Storage of Audio Tech's finished goods within factory premises and at its distribution centre.
- (b) Scheduling and dispatch of goods using trucks to retail outlets and distribution centres.
- (c) Activities related to order taking from retail outlets as well as direct orders on the company's website.

Marketing and Sales

Activities such as advertising, promotion, distribution channel selection, sales force management, pricing policy and such other activities that make the customer aware of the product would be listed here.

All of Audio Tech's activities that relate to the above list of activities whereby it aims to by spread customer awareness would be classified here, it aims to build customer loyalty by offering quality products.

Service

Activities related to after sales service such as installation, repair and part replacement would be classified here.

Audio Tech has a separate department to handle customer complaints. Customers can return the product if quality specifications are not met, Also, any activity relating to after sale service would be classified here.

Below are certain measures that Audio Tech can implement to Reduce Costs

(a) Just in Time raw material procurement system: Procure input materials and components only when needed for production and handling. This would reduce inventory holding costs. Less inventory on hand could also result in savings in storage and material insurance costs. Before implementation, the company needs to consider the risk of loss incurred on account of stock-outs. It needs to develop close relationships with its suppliers to ensure streamlined delivery of inputs. At the same time inputs should meet the required quality standards.

(b) Company's trucks deliver the finished goods to retail outlets as per a fixed schedule each week, irrespective of the load they carry. This indicates that there may be possibilities of diseconomies of cost. If there is a pile up of inventory due to lesser number of truck delivery runs, it could lead to high inventory holding cost. Conversely, if delivery runs are scheduled even if the trucks are not loaded to full capacity, diseconomies of delivery cost would creep in. Therefore, the production and truck delivery schedule should be streamlined efficiently and economically.

(c) Audio Tech lays importance in the quality of the product to ensure customer satisfaction. Lower the defects higher the customer satisfaction. It has extensive testing and inspection processes in place. This preventive step should be assessed to find out if it is effective in reducing the cost of poor quality - internal failure cost as well as external failure costs. Internal failure costs (repair, scrap, rework) are associated with defects found after the production but before delivery to the customer. This can be avoided, if quality inspection is done throughout the production work-flow rather than just at the end of production. External failure costs (repairs and servicing, sale returns, warranty claims, complaints) are incurred when the

customer finds the product defective and returns it. External failure costs can severely impact customer loyalty and should be minimized.

Therefore, Audio Tech should invest in preventive and appraisal costs to ensure good quality in order to balance out the cost of poor quality. Preventive costs would include quality planning and assurance, error proofing quality improvements, education and training. Appraisal costs could be inspection, quality audits, supplier rating etc. Total Quality Management (TQM) and Six Sigma could be effective tools to ensure efficient good quality production that would minimize cost of poor quality.

(ii) Alternate Performance Measurement Mechanism considering all Stakeholders

Audio Tech uses Balanced Scorecard to measure performance. Balanced Scorecard focuses on the financial, customer, business, and innovation perspectives. It is given that the company is doing well on financial and customer satisfaction parameters. Market capitalization has also increased over the years; the company is on a growth trajectory. However, the company is facing issues in the form of high employee turnover and dissatisfaction among truck drivers who deliver the goods.

An alternate performance measurement mechanism can be Performance Prism. This is a second-generation performance management framework conceptualized by Andy Neely and Chris Adams.

The reasons why it would be an effective replacement for models like Balanced Scorecard are:

(a) Balanced scorecard focuses on just two of the stakeholders - Investors and Customers. Performance measurement of other stakeholders like employees, suppliers, government etc. have not been considered. The other stakeholders play an important role in the growth of the company's business. Hence, performance measures are needed to monitor both their contribution to the company as well as their overall satisfaction with the company.

(b) Most of the performance measurement models do not focus on the changes that need to be made to strategies and processes. Balanced Scorecard assumes that once the strategies are implemented, measuring a relevant set of metrics of performance will ensure that the rest of the business also functions properly. However, this is not true. In the case of Audio Tech, both customers and shareholders are happy with the company's performance. Yet even in a growing business, the drivers of growth, namely other stakeholders like employees and suppliers are not satisfied. Neither is their contribution nor their satisfaction is captured under the Balanced Scorecard performance measurement.

(c) A company has a "Quid Pro Quo" relationship with all its stakeholders. Stakeholders contribute to the company's business while they also derive benefits from it. For example, employees perform their functions well, this is their contribution to Audio Tech's growth. In return, employees would want good working condition and pay to remain motivated and loyal to the company.

Therefore, Performance Prism can be an alternate performance measurement mechanism that considers metrics related to a broader set of stakeholders of an organization, not limited to just customers and shareholders alone.

Five Interrelated Facets of the Performance Prism

(i) Stakeholder Satisfaction

"Identify the organizations set of stakeholders and their needs"

Unlike a balanced scorecard, the performance prism focuses on all the stakeholders of a company. Audio Tech has satisfied investors and customers, but dissatisfied employees and truck operators. The company must likewise identify all its stakeholders and determine the relative importance of each of the stakeholders. It can use Mendelow's Matrix to identify key shareholders in terms of power and interest of stakeholders. A stakeholder group with higher power and high interest (say a trade union) must be kept satisfied.

The main stakeholders of a company are:

- Investors - They want return on investment.
- Customers - They want good quality products at reasonable prices.
- Suppliers - They want better price for procurements or service.
- Government - They want revenues and development.
- Society at large - They want employment opportunities.

After identification of the stakeholders, the company must identify the requirement of each of the stakeholder group. What must the company do to ensure stakeholder satisfaction? Audio Tech has to ensure that it improves employee satisfaction in order to reduce its employee turnover. It should also address the issues faced by truck drivers and involve them in a dialogue. If they are not satisfied, the company might suffer financially in the longer run.

Performance Measure: Employee turnover ratio, average employment duration of employees, number of strikes by truck drivers etc.

(ii) Stakeholder Contribution

"What the organization expect the stakeholders to contribute and deliver?"

In the second facet, the company has to identify the contribution required from each stakeholder group and must define ways to measure contribution of stakeholders. In turn the company will have something to offer the stakeholders. This is the "Quid Pro Quo" relationship. For example, Audio Tech provides quality products to its customers. The customers in turn contribute towards the profits of the company, they pay a price for the value Audio Tech offers.

Audio Tech should provide for better working conditions to its employees. Motivated employees will perform better and remain loyal to the company. They would drive the growth of the company. Similarly, dialogue with truck drivers would be needed to provide better pay, retirement benefits and good working conditions. Truck drivers in turn need to ensure timely and safe delivery of goods to retail outlets.

Performance Measure: Efficiency of employees, productivity, on time delivery by truck drivers.

(iii) Strategies

"What strategies should an organization adopt that derives stakeholder contribution while reciprocating by ensuring their satisfaction?"

The organization should identify strategies that ensure that:

- The wants and needs of the stakeholders are satisfied.
- Stakeholders contribute to the organizations objectives.

Performance measures must be put in place to confirm that the strategies are working. Effective implementation depends on appropriate communication of strategies, implementation by managers and continuous evaluation of appropriateness of strategies. Audio Tech has to roll out strategies to retain employees by means of better pay, working conditions and growth opportunities within the company. The strategy will be effective when the employee turnover is reduced following these initiatives. Similarly, the issues faced by truck drivers need to be addressed by taking appropriate strategic decisions. The absence of strikes will indicate that these decisions have been effective.

Performance Measures: Employee turnover after implementation of new strategy, efficiency of deliveries after issues with truck drivers have been resolved.

(iv) Processes

"What are the necessary processes to satisfy the above strategies?"

Processes ensure successful implementation of strategies. Each process could have subprocess. Process owners have to be identified to assign responsibility of functioning process.

Processes require continuous evaluation. Instead of evaluating all at once, company has to identify important processes that are critical to the business. Porter's Value Chain Analysis can be used to identify and evaluate various processes in the organization.

Audio Tech should have well defined processes to hire appropriately skilled personnel organization for the job, transparent pay structure etc. This process may be owned by the Human Resource Manager. The working condition of truck drivers can be improved by providing sufficient training and better working conditions.

Performance Measures: Number of personnel hired at various skill levels, average payout for each of these skilled groups, hours of employee training, maintenance log of trucks etc.

(v) Capabilities

"What resources should an organization need to effectively operate these processes?"

The company must have the right capabilities in order to support the process. Capabilities could include resources, technology, and infrastructure for a particular process to work, Audio Tech may decide to increase pay/salaries, however it should have sufficient financial resources to make these payments.

Performance Measures: Amount spent of new recruitments and training etc.

Conclusion

"Manage these interlinked facets to cater to all stakeholders"

While meeting targets as defined by performance measures should be emphasized, the performance measurement system should be dynamic and flexible to allow the stakeholders to voice their opinions and expectations as well. Taking their requirements into consideration, along with managing capabilities and processes, Audio Tech can implement effective strategies that will cater to the needs of all stakeholders.

ANS 2:-

DMAIC technique analyses operational problems by assessing them in the following phases (1) Define; (2) Measure; (3) Analyze; (4) Improve and (6) Control.

(1) Define the problem, project goals and customer requirements: Poor quality leading to erosion of clientele.

Customers feedback indicates that product quality requires improvement. Dis -satisfaction is reflected in the form of sale returns and warranty claims. Competitors have no sale returns on account of poor quality as well as no warranty claims on its products. Hence, in an environment where 100% quality can be achieved, DFS is facing quality issues. This is the problem to be addressed. Failure to do so would result in loss of clientele, leading to a possibility of going out of business. The goal of the project is to identify what is the sigma level at which the company is operating and to suggest improvements to the **production process it to achieve 6 σ level of operations.**

(2) Measure current performance: Indicators of poor quality to find out what is the sigma level of the current operations?

Current performance focusing on quality can be determined based on the cost incurred in the following phases:

(a) Sale returns: Sale returns are 1% of total sales. Gross sales are 25,000 units per annum at selling price of Rs.20,000 each, therefore having a value of Rs.50,00,00,000. Sales returns @1% amount to Rs.50,00,000 that represent the return of 250 units per annum. The cost of poor quality on account of these sale returns is the variable cost of the product Rs.12,500 per unit. This is an avoidable cost amounting to Rs. 31,25,000/- per annum that is 0.63% of sales (Rs. 31,25,000/ Rs.50,00,00,000).

(b) Warranty claims: Warranty is an undertaking given by the company to repair the electronic component free of cost if defect occurs within a specific period of time. Hence, when the customer files a claim that is accepted by the company, it means that there has been an issue

with the quality of the product. This is a liability / cost that should ideally be kept minimum, if not nil like DFS's competitors.

Warranty for the product is for one year from the date of sale, Warranty claims this year is Rs.30,00,000, which is given to be representative of the average yearly warranty cost. Therefore, currently this cost amount to 0.60% of sales (Rs. 30,00,000/ Rs.50,00,00,00).

Summarizing sale returns and warranty claims alone represent 1.23% of current sales, Considering the current percentage of deficiency, the company is operating between 3 σ and 4 σ level. The rest of the industry is able to achieve 6 σ level of operations, At zero defective production, there are no sale returns on account of quality and no warranty claim costs. Therefore there is tremendous scope for improvement in DFS's operations.

(3) Analyze: What is the cause of poor quality? What is the cost of resources focused on quality?

Six sigma team studied the production process in detail. Replicating the issue detailed in the given problem:

(a) Problem 1: Assembly line workers, including new hires, learnt on the job as to how to assemble the input material to produce the final electronic component. This lead to many errors due to lack of proper standardized training. Therefore, on account of these errors, the entire electronic component has to assembled again.

(b) Problem 2: Sub-standard quality of raw material is detected on inspection only at the assembly line. Inspection leads to 10% rejection of units. By this time, the defective material is already fitted into the final electronic component. Therefore, to entire component has to be reworked upon to replace the defective raw material input,

(c) Problem 3: Machines are outdated and are not entirely suitable for the current production methodology.

The above factors result in rework on products, an internal failure cost, that lead to wastage of material, resources and capacity.

Two costs incurred to focus on quality are cost of inspection and cost of rework

2,525 units are reworked upon. Time required to rework 2,525 units per year = 2,525 units / 5 units per hour = 505 hours per year. Cost of rework is given to be Rs. 6,250 per hour. Therefore, total cost of rework per year =Rs. 31,56,250.

Inspection cost for 2,000 hours at the assembly line is given to be Rs.10,00,000 per annum, Therefore, total cost of resources currently incurred for quality = Rs.41,56,250 per annum.

(4) Improve: Reduce errors and improve quality of the product

While cost of resources currently incurred for quality is only 0.83% of sales (Rs.41,56,250/ Rs. 50,00,00,000), a detailed analysis brings forth many qualitative aspects that DFS needs to be address. If its competitors are able to achieve excellence in quality, so must DFS, in order to remain in business. Therefore, following are the proposals that can provide solutions to the problems referred to above:

(a) Solution to Problem 1: Periodic training sessions to educate new hires and update workers in the assembly line on the latest techniques in production. Standardized and informed working will lead to lower errors and thereby improving product quality. Cost per year = 5,000 hours yearly training x Rs. 1,000 per hour = Rs.50,00,000.

(b) Solution to problem 2: Delay in detection of poor quality input can be resolved by streamlining the work flow. New function for quality planning and improvement, at the beginning of the process helps in early detection, without wastage of resources. Cost per year for introducing this functionality Rs. 1,50,00,000.

(c) Solution to Problem 3: Replace old machines with newer ones. Machine upgrade will align the resource with the production requirements. This reduce chances of errors in the production process.

Cost of procurement: Rs.3,60,00,000 has a life of 3 years. Therefore, annual depreciation is Rs. 1,20,00,000.

(d) Consequences of implementing these proposals, as given in the problem, can result in the following improvements:

(i) Rework of products can be entirely eliminated.

(ii) Sale returns will reduce from 1% to 0% due to better quality of products.

(iii) Yearly Warranty claims will reduce from Rs.30,00,000 to nil per annum.

(iv) With the introduction of the new facility, time required for inspection at the assembly line would reduce from 2,000 hours to 1,200 hours. Cost of inspection at the assembly line would reduce from Rs.10,00,000 per annum to Rs. 6,00,000 per annum.

(v) Due to better quality, DFS can build better reputation with the customers which can further yield additional sales of 5,000 units per year.

When the company is capable to achieve points (i), (ii) and (iii) milestones, it would have achieved 6 σ operational level. The cost of quality report summarizes the above discussion:

Cost of Quality Report				
Cost of quality Component	Before Improvements		After Improvements	
A. Preventive Cost				
Training (5,000 hrs. \times Rs. 1,000 per hour)	XXX	XXX	50,00,000	0.83%

Quality Planning and Improvement	XXX	XXX	1,50,00,000	2.50%
B. Appraisal Cost				
Inspection Cost	10,00,000	0.20%	6,00,000	0.10%
C. Internal failure Cost				
Rework	31,56,250	0.63%	XXX	0.00%
D. External Failure Cost				
Sales Returns	31,25,000	0.63%	XXX	0.00%
Warranty Claims	30,00,000	0.60%	XXX	0.00%
Total Cost of Quality	1,02,81,250	2.06%	2,06,00,000	3.43%
Yearly Sales	50,00,00,000		60,00,00,000	
Total Cost of Quality / Sales (%)	2.06%		3.43%	

(e) Cost of quality is 2.06% of sales of which 1.23% alone is external failure cost. This has an impact on the customer experience and can erode customer base. By implementing the six sigma team's proposal, this external failure cost on account of sale returns and warranty costs, can completely eliminated. Internal failure cost can also be eliminated., The increase in cost of quality proposed to be made would be a preventive cost to avoid failure of quality. The company should focus on preventing the error such that it ensures that product is of good quality when it reaches the customer at the very first instance. This enhances the customer experience and therefore eliminating the scope for external failures like sales returns and warranty claims. Better quality can yield further sales of 5,000 units per year. Therefore, an increase in spending on quality measures is justified since it not only yields significant improvements to quality but also brings in more sales orders.

Improvement to the financial position of the firm is summarized below:

Particulars	Amount (Rs.)
Improved Contribution Margin (Ref. note)	3,75,00,000
Elimination of Goods Replacement	31,25,000
Elimination of Warranty Claims	30,00,000
Elimination of Rework	31,56,250
Savings in Inspection Cost	4,00,000
Total Benefit (A)	4,71,81,250
Additional Costs Incurred	
Training	50,00,000
Quality Planning and Improvement	1,50,00,000
Increase in Fixed Cost (Yearly Depreciation of Upgraded Machines)	1,20,00,000
Total Additional Cost (B)	3,20,00,000
Net Benefit (A) -(B)	1,51,81,250

Note: Incremental Contribution:

Sales have increased by 5,000 units. Selling Price is Rs. 20,000 per unit while variable cost is Rs. 12,500 per unit. Contribution is Rs. 7,500 per unit.

Conclusion:

Six Sigma team's proposals are focused on preventing the error from occurring. Consequently, quality improves, sale improves and thereby can yield a net benefit of Rs. 1,51,81,250 per year to the company.

(5) Control: Maintain quality at 6 σ level and keep the production facilities updated

(i) Training sessions with workers, can serve as two way communication platform to detect other problems that can be resolved in more timely manner.. Inputs received can also be used to improve the production work flow as well.

(ii) New function of quality planning and improvement can help the company be better informed about the latest production methodologies.

(iii) Updated machines are better equipped to handle changes in the production process since they are built with the latest technology. DFS should do a continuous assessment of the state of its machines and upgrade them when necessary.

ANS 3:-

Calculation of Shifts

Days per week (A)	6
Shifts per week (B)	2
Total Working Shifts per week (C = A \times B)	12
Total Weeks (D)	4
Total Shifts (E = C \times D)	48

Calculation of Loss of Time per shift

Breakdown Maintenance (in mins)	360
Set up Changes (in mins)	900
Power Failure (in mins)	240
Total (A)	1,500
Loss of Minutes per shift (A/48)	31.25

Availability Ratio per shift = $\{(395 \text{ mins} - 31.25 \text{ mins.}) \div 395 \text{ mins.}\} \times 100\% = 92.09\%$

Actual Production	=120 units per shift
Standard time	=3 minutes
Standard Time required	=120 units × 3 minutes
	= 360 minutes
Actual Time taken	=395 mins. – 31.25 mins. = 363.75 minutes
Performance Ratio	= $[360 \text{ mins.} \div 363.75] \times 100 = 98.96\%$
Quality Ratio	$\{115 \text{ Parts} \div 120 \text{ parts}\} \times 100\% = 95.83\%$
Thus, OEE	= $0.9209 \times .9896 \times .9583 = 87.33\%$

ANS 4:-

The current situation of Welcome Foodies, a small family-owned restaurant, resembles a lot like that of dissociation of staff efforts, unplanned activities and need for reengineering of business activities. The processes there contain a lot of known defects that are being continuously overlooked. There are several quality issues as well, not just in some phases of the service but holistically in series of activities. So, when defect is the prime issue to focus upon, we look for total quality management to render the product/ service defect free to ensure the long run success of the business, but here we need to take a step further discussing the roots of the issue rather than just simply working on the symptoms. For example, long wait time of guests is considered as symptom, while the root cause is disorganized staff team and non-strategic output towards a destined focus, i.e., customers. Frankly, we are talking about Six Sigma strategy to get the changeover done.

While people often relate six sigma methods to manufacturing firms and the industry itself, service industry could very well adapt it pragmatically. The forerunners of the technology were

Motorola and General Electric who gave a scientific solution to the all-pervasive quality issue evidenced in the day today businesses. Quality issue in physical product means compromise in the shape, size, color, design, taste, or any other form that reduces its true expected utility. The Quality issue in service on the other hand means variation in the customer's standard experience set as per Industry norms. Defect therefore means a quality issue that leads to the failure of any product or process. Six Sigma entices one not just to deliver defect free product' services but also to reduce waste by eliminating errors. The steps involved to improve existing business processes are define phase, measure phase, analyze phase, improve phase,

control phase. Now let us see how we can implement each phase to improve the WF's business situation.

Define Phase

This is the foundation of other phases of the methodology on which they rest. Under this phase, of we identify the processes that need improvement, the goals and scope of improvement. In WF's case, the goals of improving the service process are below:

- a. Exuberating the customers' overall dining experience including reduction of total wait time.
- b. Achieving enhanced staff communication and coordination ensuring unclogged flow of information.
- c. Ensuring the rendering of ordered food items as per description in the menu card.
- d. Kitchen chefs to prepare and process food items as per their skill set.
- e. Reduction of the overall processing time of food items once orders are received.
- f. Resolving hygiene concerns.

Measure Phase

Under this phase, we are primarily concerned with gauging the problem, meaning seeking a quantitative tool to define the problem so that it can be used to measure the current performance.

Moreover, we also need to employ effective data collection techniques to obtain data about the current performance. The success of this phase depends on the validity of the data collected.

We must keep in mind that only when the current performance is quantifiable, we could compare it against the standards to identify the variation. These are the traditional steps to bring about an improvement in any process.

We catalogue numerous basis to measure each issue to be improved as indicated in the goals above.

- a. Number of customers leaving the restaurant for having to wait too long.
- b. Number of unhappy customers not returning back.

- c. Number of complaints reported against staff misbehavior.
- d. Average wait time per customer.
- e. Average food processing time per simple item and per complex item.
- f. Number of accidents due to nasty floors.
- g. Number of complaints against food quality and order mismatch to description in the menu card.

Analyze Phase

This phase involves establishing the root cause of the symptoms palpable in the deficient service process.

In WF, it would be vital to itemize the entire restaurant service processes in the order of their occurrence. This can help firm to look at things in a serial manner rather than taking plethora of activities all at once.

- a. Customers enter the restaurant.
- b. Receptionist greets and asks them to wait in the waiting area until their names are called upon.
- c. Cleaning team clean the tables once the guests are done eating.
- d. Receptionist calls the guests in the order of their arrival.
- e. They enter the dining area, seat on the indicated table, place order of the food items of their choice from the menu card.
- f. The waiters take the order to the chefs in the kitchen for preparing the ordered stuff.
- g. Kitchen chefs prepare and process the food ordered, served on plate, to be taken up by waiters.

- h. Waiters serve the food to the guests and check with them for coming requests.
- i. Waiters keep visiting kitchen and serving stations to get the requested stuff on the table.
- j. Finally, guests finish their dine; request the staffs to furnish the bill of the service.
- k. The cashier prepares the bill, taken to the guests for payment.
- l. Guests pay the bill and leave the restaurant.
- m. Cleaning team again starts the cleaning process to make room for other guests in the waiting area.

In this way, the whole process gets broken down into small sub processes. This is the true effort involved in analyze phase. Once all the activities carried out are identified we need to bifurcate them into value added and non-value-added activities, basically we need to pull the bottlenecks out of the entire process to bring efficiency.

Improve Phase

This phase is all about recommending alternatives and implementing them to resolve the established issues. For example, if the issue at hand is about two cars falling short for picking up the employees to render an effective pick drop facility, the alternative is to employ more buses or cars to do the same. Where the firm is unable to do so, it can resort to third party services who deliver this form of service. It will end up in choosing the alternative that is financially more feasible.

In our case, we can clearly perceive humungous scope of improvement. First of all we must keep in mind that the effective wait time of customers in the service business is a critical factor for success. The long wait time of customers in the waiting area can be directly ascribed to age old cleaning techniques of the staff. The idea here is to introduce innovative techniques of cleaning the tables such that it takes hardly any time to get the table ready for oncoming guests.

Next it is also evident that staffs of WF are not well groomed and lack appealing strategies to enhance the dining experience of their guests. Organizing frequent training sessions to boost their marketing skills like placid smile and greeting the guests with warm-heartedness keeping up a continuous check of their requests and fulfilling them on timely basis; making them aware of any special coupon or discount that the restaurant puts up; can all bring a drastic change in the customer's apprehension of the WF's services. Hiring people with supervisory acumen will help staffs to be aware of their scope for improvement and rule out their possibility of repeating same mistakes.

Now let us see what could be done on improving staff coordination. Staffs should be motivated to work as a team rather than on stand-alone basis since it is the combined effort that is representative of WF identity. Any bottleneck in unbound communication should be outrightly removed so that things flow in a streamlined fashion. It is also necessary that WF hire additional staff to meet the growing need of the city such that manager can dedicate himself to the top priority matters rather than playing multiple roles. An efficient reward system should be put in place to ensure each staff's effort in the process is recognized and rewarded for. This will motivate them and push their determination to work productively rather than missing on peak weekends and returning on Tuesdays. If they work with efficacy during their normal hours, the need of overtime would also reduce.

Finance requirements can be fulfilled by building up good creditability among customers such that an effective business plan itself can propel the lender to provide the required finances.

Further, more kitchen equipment will have to be purchased and cleaning techniques have to be explored such that kitchen staff work productively rather than working laboriously. Just three chefs sound like a real short supply of cooks, driving them to prepare things they are not trained for. The WF should adopt strict food processing policies such that chefs are allowed to prepare only cuisines for which they are groomed. This will ensure complying with strict food quality standards to accentuate no compromise in food quality. Moreover, a fixed processing time of both simple and complex items should be specified and it should be the policy of the restaurant to abide by the same.

Organizing kitchen equipment and food ingredients would eliminate the additional time required to locate them. WF can apply 5S methodology here to cleaning out the working area and maintaining the cleanliness to improve process quality. 5S means sort, set in order, shine, standardize, and sustain. WF needs to ensure that no unnecessary items like perished ingredients/food items, old equipment, and old cleaning tools are seating in the kitchen (Sort).

To bring in more efficiency, we must place frequently used items in easily accessible locations and place occasionally used items at bay (Set in order). For example, a veggie sandwich making store can organize its veggie counters near to its ordering and processing center, so that it takes them less time to prepare sandwiches once order is received. Scientific arrange- merit helpsnot just in saving time, it also boosts workplace cleaning. With order comes cleanliness in the workplace (Shine). WE should adopt best practices of the industry or make one to be adopted as the constitution (Standardize). For example, in present case, we need chefs to prepare food items only for they are specialized. Monitoring the adopted practices under 5S model is also no less important. This ensures that we can upgrade those practices if situation demands **(Sustain)**.

Prefixing startup items like sauces, pickles and serving them with starters will help eradicate the wait time once guests are ready with their orders. Employing advanced food processing machineries will drive efficiencies and help meet new standards of WF.

The hygiene concerns can be easily dealt with by applying planned and innovative cleaning ideas to clean the dining and waiting area and using sign boards to warn the subsisting guests of the ongoing cleaning process.

Bringing in automatic scanners and advanced technology will eradicate the manual entry of order details and their prices to prepare the bills, thereby ruling out the possibility of manual errors and thefts.

The Control Phase

This phase deals with adequate determination to put into practice the policies developed under the "Improve Phase" and ensure its persistent compliance in the rendering of the service. Once the policies become culture of the people, it would be hard to be discern them without such policies. As part of control phase, the changed performance is measured at regular intervals to establish any variances from the expected standards.

ANS 5:-

Report

Addressed to:

Office of CEO,

Dewar Bikes

Dated – 06th May 2020

Analysis of Quality Costs

The reporting of quality costs highlights the cost of quality activities at DB., The total quality costs statement clearly displays the relationship between conformance costs (prevention and appraisal costs) and non-conformance costs (internal failure and external failure costs) and the drivers of a reduction in the overall spending on quality. Statement indicates that only 2.16% of the total quality cost is the cost of preventing quality problems while 0.50% is the cost of appraisal activities. Thus, prevention and appraisal costs make up only 2.66% of total quality costs. In contrast, 97.34% of quality control costs are incurred for internal and external failure costs.

Two measures to reduce non conformance cost

Total Productive Maintenance (TPM) is a system of maintaining and improving the integrity of production and quality system through keeping all equipment in top working condition so as to avoid breakdowns and delays in manufacturing processes. It involves identifying machines in every division (including planning, manufacturing, maintenance) and then planning & executing a maintenance programme covering their entire useful life.

In this case, TPM will help in reducing internal failure cost (i.e., downtime and manufacturing rework cost), which constitutes 25.95% of total quality cost, by keeping all equipment in good it is working Conditions so that there is no downtime or machine breakdown and ensuring that h all equipment run smoothly. If machines work properly, the chances of rework will reduce, ultimately will also reduce chances of warranty repair and customer complaints (comprising 71.39% of total quality cost which is a major part of total quality cost).

Total Quality Management (TQM) aims at improving the quality of organisational output, including goods and services, through continual improvement of internal practices. Its objective is to eradicate waste and increase efficiency without compromising with the quality. It requires maintaining quality standards in all aspects of business by ensuring that things are done right the first time so that defects and waste are eliminated from operations.

It appears that DB is not a TQM company at present, due to huge disparity between conformance costs and non-conformance costs. In order to make DB to be successful, all staff at DB must be engaged in the improvement process and share in the continuous improvement be ethos. In order to establish a reputation as a high- quality bike manufacturer DB must ensure, staff is having attitude towards the importance of conformance activities, for instance, DB can conduct third party inspection of components at supplier's workplace leading to maintenances DB of quality standards.

Overall, while applying above two measures, in the DB, consideration must therefore be given to the optimum balance between the costs of conformance and the costs of non-conformance.

Implementation of Just in Time

Just in time purchasing and production technique will put an end to the harrowing task of inventory management. In this form of pull system, purchasing of components and production of bikes will be based on customer demands and DB will have to accordingly coordinate with its suppliers to supply the right quantity of components required at the right time. JIT inventory management calls for having the inventory as and when needed also taking care of massive holding cost suffered related to large build ups. In this environment, DB will also be able to reduce the manufacturing time around 3 hours by streamlining the flow of information in entire supply chain.

Dewar is assessing alternative suppliers on continuous basis to improve capacity and performance. It means it is changing sources of material regularly or using multi-suppliers. In contrast, JIT is based on reduced number of supplier and move towards single sourcing. It is easier to develop long term cooperative relationships with a smaller number of suppliers. The quality of internal service and an organization's ability to provide quality products or services to its customers depends upon this relationship. However, this relationship is obviously missing in DB.

DB has close relationship with the retailers but relationship with suppliers is equally important.

It appears that firm is also importing its requirements from abroad. In JIT environment, it is important that suppliers are, to the extent practical, located in close proximity to the manufacturing plant. Carefully selected suppliers are capable of delivering high quality materials in a timely manner, directly at the shop floor, reducing the material receipt time. Therefore, selection of right supplier located in close proximity to the manufacturing plant is vital for the proper implementation of JIT.

It is also important to note that every supplier is different, but the DB has to be able to view each as one of its part only. The supplier's network must be able to call up and communicate directly with the DB's network, obtaining manufacturing schedules and product specification in real time. ERP and other sources of electronic data interchange between supplier and DB will act as backbone in supporting the JIT activity.

On the whole, DB's management has to treat suppliers as partners with significant influence on the success of the organization.

The functional division is less appropriate in JIT environment. JIT production requires multi-skilled teams,. In DB, teams need to be formed to work by product i.e., type of bike rather than by the type of work performed. In addition, staff will need training to work in the new teams, measures surrounding the amount and effectiveness of training will be required. A JIT system works best when employees pitch in with suggestions for improvements. The performance can be measured by computing the number of ideas per worker, the number of ideas suggested in total, the number of ideas implemented, or the proportion of ideas suggested that are implemented.

DB forecasts demand based on its internal policies and historical trends. Today demand in every sector of the market changes by leaps and bounds, so using historical data is not at all recommended. Demand forecasts should be pulled by current market trends and prediction of future market sentiments. However, in case of DB, demand is unstable. In this case, in order to prevent stock-outs, inventory managers can only increase the Kanban numbers of each product; the greater are the variations, the greater is the need of Kanban cards and, thus, the higher is stock level and need more working capital per rupee of sales

Conclusion:

The Board desires to improve the quality as well as financial position which can be achieved through successfully implementation of quality control and lean system, However, the factors discussed above should be taken care of It is worthwhile to note that any return on investment in proposed system must be viewed long term rather than short term since optimum results not be realized until the system has been in place for some time.

Further details can be tabled on requisition basis.

Closure of Report

Chief Management Accountant

(For Management Accounting Department)

Dewar Bikes

