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A TOTAL MANUFACTURING SOLUTIONS TECHNIQUE TO SELECT APPROPRIATE IMPROVEMENT STRATEGY: CASE STUDY OF A FOOTWEAR FACTORY

Abstract: *The Government of Ethiopia is promoting the manufacturing sector to join the global market in a large scale. Due to its comparative advantages, the Ethiopian leather and leather products industry have been given due attention. To fully utilize such advantages, the country shifted its export items from hides/skins to footwear products. Nevertheless, the performance of the leather sector in general and footwear sub-sector in particular is far below the desired standards. The improvement strategies applied hitherto were mainly to tackle a small portion of their total problems. If the Ethiopian footwear companies have to become globally competitive, their entire business spectrum has to be assessed and appropriate improvement strategies must be selected. In this research, we used a Total manufacturing solutions (TMS) technique to identify areas of improvement and improvement strategy of one of Ethiopian footwear companies. For this purpose, we conducted two surveys using structured questionnaire. The first survey was to test the TMS technique against the context of footwear industry. The result proved that the original TMS model can be used to measure the performance of footwear companies. The second survey was done to identify company's total problems, map its current position and select appropriate improvement strategy. The result revealed that the company has company-wide problems and its current position is a plodder. For plodders which have company-wide problems, the improvement strategy must include aggressive application of BPR; and the implementation of best practices to develop workers skills that encourages networking and promotion, a market-led manufacturing strategy, employee involvement and team work cultures. According to the findings of this research, we suggested that a BPR technique followed by a continuous improvement programme could be an appropriate improvement strategy for this company. The company requires long-term improvement programme to achieve the category of world leaders.*

Keywords: *total manufacturing solutions, Footwear Company, current position, improvement strategy*

1. Introduction

The Government of Ethiopia has given due attention to the manufacturing sector to join the international market in a large scale through developing various industrial development programmes. One of such programmes is the full-fledged industrial development strategy that was developed in 2002/03. The strategy gives huge emphasis to the manufacturing of export – led and value - added products by promoting capital saving and labor-intensive products. The Leather and Leather Products Industry (LLPI) is to a large extent labor intensive, capital saving and creates the opportunity to be globally competitive, special attention has been accorded for its expansion in Ethiopia. The availability of large livestock population, cheap labour force, existence of big tanneries, and open access to international markets constituted the country's comparative advantages in the leather sector. In order to successfully utilize the opportunities of the local and international markets in the leather sector, the country has shifted the major export items from the low value-added hides/skins to high value-added footwear. The footwear sub-sector is expected to lead the leather sector's modernization to build a big impact on Ethiopian economy, job opportunity, foreign exchange and poverty reduction. However, Tigray online (www. Tigraionline.com) and Tomas (2011) mentioned that, despite the leather industry's potential to become a world class supplier of high quality footwear, the leather industry in general and the footwear sub-sector in particular had underperformed for centuries. Tomas (2011) explicitly noted that the majority of footwear producers in the country are unable to respond to foreign wholesalers and retailers requests to fulfill their order in the required quantity, quality and time. Many other research findings also confronted that the level of competitiveness of Ethiopian footwear business in the international market is far below the required standard (Birkinesh, 2012; the Embassy of Japan in Ethiopia, 2008; Sutton and Kellow, 2010; Ethiopian Leather Journal, 2011). The researchers argued that the Ethiopian footwear sub-sector is underpinned by several problems. The earlier improvement efforts applied were mainly focusing on short-term tactical issues to tackle a small portion of their total problems. These companies didn't achieve a subsequent improvement in their performance due to a failure to address the whole dimension of their business. For a business company to become globally competitive, it must be strong in all its business dimensions (Basu and Wright, 1997; Neely, 1999; and Hammer and Champy, 1993). Moreover, with the conceptual model they developed for competitiveness of Indian manufacturing organizations, Amit Kumar Marwah *et al*. (2014) also suggested the various factors (such as supplier-buyer relations, external supply chain, human metrics, environmental factors, information sharing and supply chain approaches) that the companies must improve in order to enhance the performance of their supply chain. Moreover, Wieslaw Lukasinski (2013) indicated the need of organizational self-assessment towards constant improvement of all organizational elements to enhance organizational competitiveness. Thus, it is indispensable for Ethiopian footwear companies to assess the performance of their total business process and select appropriate improvement strategy to become globally competitive. But, which improvement strategy is appropriate for Ethiopian footwear companies to improve their global competitiveness? Recently, manufacturing companies use different management philosophies and techniques such as Total Quality Management, Just-In-Time, Flexible Manufacturing System, Balanced Scorecard, Business Process Reengineering, and Lean Manufacturing to

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solve their business problems (Desta, 2011; Fasika *et al*., 2013). However, most of the manufacturing companies are blindly trying to follow these three letter acronyms without prior assessment of their requirements (Basu and Wright, 1997). The authors revealed that a lack of in-depth analysis of what is appropriate for a company has caused many sound change programs to fail. They highly argued that a technique that integrates the conversion process inside a factory with all other business processes such as marketing, research and development, supply chain management, financial and information management and human resource management - and also with external factors such as environment and safety and customer care and competition has to be used to measure the performance of manufacturing companies in order to select appropriate improvement strategy. For this purpose, they developed a systematic approach, called total manufacturing solutions (TMS), for evaluating all the aspects of manufacturing standards in order to identify a set of determinants influencing business performance, identify areas of improvement and improvement strategy. Though there are numerous processes that organizations can follow to design and implement performance measurement systems, a total manufacturing solutions (TMS) approach is peculiar as it considers the measurement of the whole spectrum of the business dimensions and in mapping the present position of companies in a very systematic manner to devise their appropriate improvement strategy. According to the TMS technique, the choice of appropriate improvement strategy is highly influenced by the current position of companies. The authors grouped manufacturing companies into five categories based on their practice and performance scores (see figure 1 and annex 1). Accordingly, if the Ethiopian footwear companies have to work towards realizing their vision of becoming globally competitive, the whole spectrum of their supply chain must be assessed and appropriate improvement strategy should be selected and applied. As such, in this research, a TMS technique has been applied to assess the performance of one of Ethiopian Footwear Company and map its current position in order to select its appropriate improvement strategy. TMS measures all aspects of business organizations against six pillar areas underpinned by 20 foundation stones (Basu and Wright, 1997). According to this technique, the whole performance of a company rests on these pillars. These pillars are divided into three primary pillars of performance activities and three secondary or supportive pillars of practices as shown in table 1.

Table 1. Pillars and Foundation Stones of the TMS Technique

Pillars		Foundation Stones
Performance (Primary) pillars	Marketing and innovation	1. Understanding the marketplace
		2. Understanding the competition
		3. Process and product innovation
	SCM	4. Manufacturing planning and working with suppliers
		5. Distribution management and working with customers
		6. Supply chain Performance
	Manufacturing Facility	7. Sourcing strategy
		8. Appropriate technology

		9. Flexible manufacturing
		10. Reliable manufacturing
		11. Manufacturing performance
Practice (Secondary or supportive) Pillars	Environment & Safety	12. Product safety
		13. Industrial safety
		14. Environmental protection
	Procedures	15. Quality management
		16. Financial management
		17. Information technology and systems
	People	18. Management skills and culture
		19. Flexible working practices
		20. Continuous learning

In order to achieve and sustain a leading competitive advantage, a manufacturing company must show 'very good' or 'excellent' results in both performance and Practice indices. The writers revealed that the aim of pillars of primary activities is the achievement of higher performance standards and the pillars of secondary activities are to achieve best business practices. Readers can get further insight on the importance of each pillar, and their foundation stones, from Basu and Wright (1997).

2. Research methodology

Various literatures were surveyed to examine the current industrial development strategy of Ethiopia towards the expansion of its manufacturing sector. Further, comparative advantages of the Ethiopian leather and leather products industry and the level of their competitiveness in the world stage were identified and the gap existing with the presently applied improvement system was investigated. Using the existing literatures, the need for prior assessment of the whole spectrum of companies with due attention to mapping their current position to select appropriate improvement strategy for global competitiveness were emphasized. As a result, a TMS technique was selected to show how companies can systematically secure competitive position through mapping their current position using a case study of Ethiopian Footwear Companies.

In order to collect data from the companies for the preparation of this research paper two surveys, namely the preliminary survey and self-analysis survey, were conducted using structured questionnaires. The preliminary survey was conducted to collect data from four Ethiopian footwear companies, which are currently engaged in the export market, to customize the original TMS model to the context of a footwear business. In this survey, for each of the foundation stones, five options were developed. These options were:

Option 1: the foundation stone is not relevant at all to a footwear industry performance.

Option 2: the foundation stone is slightly relevant to a footwear industry performance.

Option 3: it is good to measure the foundation stone and improve its performance to be competitive.

Option 4: it is very good to consider the foundation stone and improve its performance.

Option 5: It is a must to consider the foundation stone.

Respondents were requested to tick only one option for each foundation stone based on its relevance to the context of a footwear business (see also table 2). Managers, deputy general managers, and department and section heads were selected as target respondents as they are the most appropriate persons. After we collected all the feedbacks of preliminary survey, we analyzed it using microsoft excel sheet. First, for each of the foundation stones, we identified the percent of respondents who selected each option (see table 2). Then, we systematically calculated the average point (option) for each of the foundation stones. Finally, depending upon the average point (option) obtained from the feedback of the respondents for each foundation stone, decision was made to consider or omit the foundation stone(s). There is no reason to consider the foundation stone when the average point obtained is 1. This means that it will not affect the performance of a footwear company. When the average point obtained is about 2, the foundation stone is made to be considered by merging it with another foundation stone which has closer meaning. For the foundation stone its average point is closer to 3, two possibilities were looked for: merging it with a foundation stone which has a nearer meaning or considering it separately. However, those foundation stones whose average points were 4 or greater were treated separately.

The self-analysis survey was conducted to collect data from one of the four footwear companies considered during the preliminary survey to identify its performance gap and total business problems, and map its current position in order to select appropriate improvement strategy that can enhance its global competitiveness. TMS technique developers designed 200 guideline questions (10 questions for each foundation stone) as a central part of the TMS technique (Basu and Wright, 1997). In this research, these questions were adopted (with some modification) to the context of a footwear sector and used for the second (self-analysis) survey. The questionnaire was distributed to general manager, deputy general manager, department and line heads depending on their areas of expertise. 100 respondents were participated in the secondary survey. Under each of the 20 foundations stones, we asked about 10 questions that can powerfully evaluate the performance level of the company in each area. We used the five stage rating system (1= poor, 2 = fair, 3 = good, 4 = very good and 5 = excellent) for each of the question. Respondents were requested to tick the appropriate alternative depending on the performance level of the company regarding the specific point stated in the question. Using a Microsoft excel sheet, we calculated the percentage of the respondents who have chosen each alternative for each question. Then, we calculated the average point for each of the questions under each of the foundation stone. Finally, average actual score of each of the foundation stones was calculated from the average point obtained for the questions. The performance gaps in each of the foundation stones were calculated as the difference between best performance figure (taken as 5) and the average actual score obtained through the questionnaire. In order to map the current position of the company, a total score of primary pillars and the total score of secondary pillars were calculated from their respective foundation stones. The current position of the company was plotted using a practice-performance map. For the primary pillars there were eleven foundation stones. Thus, the maximum score that can be attained when all the foundation stones of the company are poor is 11 x1 = 11. In the same way if all the foundation stones are found to be fair, good, very good or excellent, the maximum attainable scores can be found as 11 x 2 = 22, 11 x 3 = 33, 11 x 4 = 44, and 11 x 5 = 55. In the case of supportive pillars there are only nine foundation stones and therefore, the maximum attainable score if all the

foundation stones are poor, fair, good, very good or excellent are 9, 18, 27, 36 and 45 respectively. For both pillars, the last three possibilities were combined on performance versus practice map to plot the present position of companies (see figure 1).

3. Results and discussion

Two surveys were conducted in this research. The first (preliminary) survey was to determine whether some prior adjustment of a TMS model is needed or not before we fully apply it during the self-analysis survey. According to the feedback of the respondents and the arguments developed in the research methodology section, the average point obtained (see table 2 below) indicated that for a footwear industry all the foundation stones should be considered without merging or omitting any. Note that the average point of the foundation stones (last column of table 2) is obtained by summing up the product of the % of respondents by the corresponding option these respondents selected and then dividing the result obtained by the sum of the % of respective respondents. For instance, for the first foundation stone we have:

$$\frac{(2\times3)+(11\times4)+(27\times5)}{40} = 4.6$$

Table 2. Result of the preliminary survey

Foundation stones	Respondents, %					
	Option 1	Option 2	Option 3	Option 4	Option 5	Average point
1			2	11	27	4.6
2			2	13	25	4.6
3			1	10	29	4.7
4			2	12	26	4.6
5		1	1	12	26	4.6
6		2	3	13	22	4.4
7		2	4	10	24	4.4
8		2	6	12	20	4.3
9		2	6	11	21	4.3
10		2	6	13	19	4.2
11			3	10	27	4.6
12		2	11	17	13	4.0
13		5	12	10	13	3.8
14		15	15	5	5	3.0
15			2	11	27	4.6
16			2	7	31	4.7
17		1	2	5	32	4.7
18			3	5	32	4.7
19		2	5	10	23	4.4
20		2	1	5	32	4.7

Basu and Wrigth (1997) suggested that improvement category and company's present position are the key criteria that must be taken into account to

select appropriate improvement strategy. According to them, there are four broad categories of performance improvement. The categories are focused improvement (fast tactical change), continuous improvement (longer-term tactical change), focused restructuring (fast strategic change) and process re-engineering (longer-term strategic change), see annex 2. The writers revealed that this type of conceptual mappings of the position of companies is widely used by many consultants. Thus, the second (self-analysis) survey was conducted to collect data from one Ethiopian footwear company to identify its performance gaps, identify its total problems, map its current position and identify its appropriate improvement strategy. The average actual score of each of the foundation stones was calculated from the feedback of the questionnaire and the result is depicted in table 3 below. For instance, there were 10 questions distributed on the first foundation stone. For instance; the first question was, how well does your company managers in marketing and sales know the importance of main products by volume, profit and trends? The respondents were requested to tick the relevant performance level (given from 1 to 5) of their company and the average score was calculated from their feedbacks and it was found as 2.9. As such, for all the remaining 9 questions their respective actual scores were calculated from which the average actual score of the 10 questions was calculated as 2.7 as shown in table 3. The performance gap figure was calculated as a difference between the target value (= 5) and the average actual score obtained. It is thus 2.3 (= 5 - 2.7) for the first foundation stone. For the remaining foundation stones, similar approach was followed to obtain the average actual scores and performance gaps (see table 3 below). The average actual scores indicate how well the company is performing in each of its foundation stones. The performance gap figures show the level of improvement that the company must go for in order to catch up best footwear producers in the world.

Table 3. Result of the Self-Analysis Survey

Foundation stones	1	2	3	4	5	6	7	8	9	10
Average actual scores	2.7	2.6	2.4	2.8	2.5	2.5	3.4	3.0	3.4	2.6
Performance gaps	2.3	2.4	2.6	2.2	2.5	2.5	1.6	2.0	1.6	2.4
Foundation stones	11	12	13	14	15	16	17	18	19	20
Average actual scores	3.1	2.7	2.5	2.8	2.9	3.1	2.8	2.9	3.1	2.8
Performance gaps	1.9	2.3	2.5	2.2	2.1	1.9	2.2	2.1	1.9	2.2

In order to map the current position of the company, the total scores of the primary pillars (=29.2) and the total score of the secondary pillars (= 27.2) were calculated from their respective foundation stones average actual scores. According to these total scores, the current position of this footwear company is plodder (see figure 1 below).

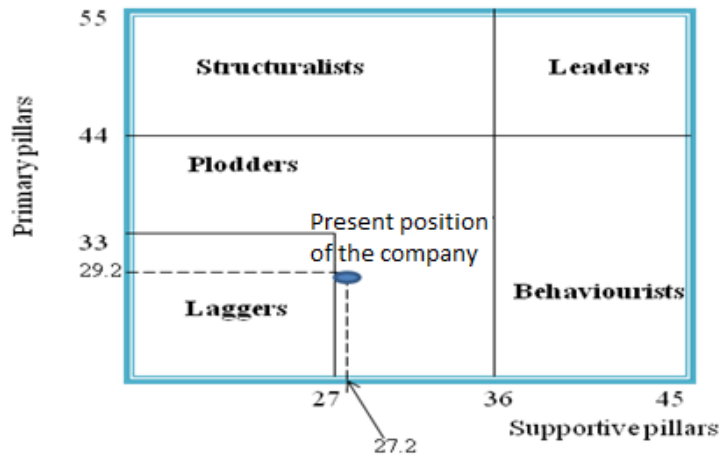

Figure 1. Performance versus practice map to show the present position of the company

This research implied that this company has company-wide problems (see annex 3). All the foundation stones of the company are weak. It lacks both performance and practices to compete in the global market. Plodders will require long-term improvement programme with significant changes to their primary pillar performances and secondary pillar practices (Basu and Wright, 1997). The authors suggested that for the plodders to reach world leaders category, their improvement strategy should include selective but aggressive application of business process re-engineering; implementation of best practices to develop workers skills; encouragement of networking and promotion of best practices within the organization; a market-led manufacturing strategy towards reducing operating costs, and improving customer services; the IT and infrastructure systems; and employee involvement and team work cultures. Therefore, according to the result of this study and the TMS approach, a BPR technique followed by a continuous improvement programme could be an appropriate improvement strategy for this company. The suggest improvement strategy is to achieve major improvements in process, cost and response time, as well as in quality, flexibility, service levels and customer satisfaction. It is also intended to give customer-focused and market-driven processes in external relations and process-focused, cross-functional, and team-oriented processes in internal operations. This will help to make effective, efficient, and adaptable processes. Overall, the improvement programmes will help the company to overhaul its organizational structure and management systems, and create employee involvement and performance measurements systems to implement skills development programmes and employees appraisal systems, to enable processes with IT system, to strengthen relationship with customers and suppliers, to improve strategies of manufacturing planning and distribution management, to understand the marketplace and the competitors, to improve their capability in process and product innovation, to develop systems for operations management, to create quality culture at all levels, and to implement industrial and environmental safety standards.

4. Conclusion

In order to increase its national economy, the Government of Ethiopia is encouraging the manufacturing sector via promoting capital

saving and labour intensive industrial sectors. The Leather and Leather products industry is one of such sectors given due attention by the Government. In order to successfully utilize the opportunities available nationally and internationally, the country has shifted the major export items from low value added hides/skins to high value added footwear. However, studies revealed that the majority of footwear companies in the country are unable to fulfill customer orders in the required quantity, quality and time due to the tremendous problems associated with their entire supply chain. Though there has been some improvement efforts applied to tackle the problems of the companies, the efforts went only to tackle a small portion of their entire problems. It is crucial for Ethiopian footwear companies to assess the performance of their total business process and devise appropriate improvement strategy to become globally competitive. Though there are numerous processes that organizations can follow to design and implement performance measurement systems, a total manufacturing solutions (TMS) approach is peculiar as it considers the measurement of the whole spectrum of the business dimensions and in mapping the present position of companies in a very systematic manner to devise their appropriate improvement strategy. As such, in this research, a TMS technique has been applied to assess the performance of one of Ethiopian footwear company and map its current position to determine its appropriate improvement strategy. The first step to use TMS approach is to test its fitness to the context of the sector under investigation. Two surveys using structured questionnaire were conducted in this study to collect data from Ethiopian footwear companies. The result of the first survey shown that the original TMS model could be used without any modification to assess the performance of a footwear industry. The second survey was conducted to determine the performance gaps of one of the Ethiopian footwear company and rank its current position with respect to the best achievable world performance figures in order to determine its appropriate improvement strategy. The study revealed that the company has a large performance gap in its entire supply chain and its current position is plodder. The company requires longer-term improvement programme to compete in the world stage. According to this research, a BPR technique followed by a continuous improvement programme could be an appropriate improvement strategy for this company. The suggested improvement strategy will improve both the performance and practices of the company.

References:

Abegaz, M.T. (2013). *Total Factor Productivity and Technical Efficiency in the Ethiopian Manufacturing Sector. EDRI Working Paper 010*. Addis Ababa: Ethiopian Development Research Institute.

Basu, R., & Nevan Wright, J. (1997). *Total Manufacturing Solutions*. Great Britain: Biddles Ltd

Cherkos, T. (2011). *Performance Analysis and Improvement of Ethiopian Leather Footwear Factories:With Special Reference to Anbessa Shoe S.C*. Addis Ababa. Ethiopia.

Curtis, G.(1995). *Business Information Systems. Second Edition*, Great Britain: Addition-Wesley Publishers Limited

Desta, A. (2011). A conceptual framework for assessing the transferability of the Japanese Kaizen Management techniques to manufacturing plants in Ethiopia. *Asian Journal of Business and Management Science*, 1(6), 09-19.

Ethiopian Leather Journal. (2011). *Special Publication for all African Leather Fair, Organized by Ethiopian Leather Industries Association, 5th edition*, Addis Ababa, Ethiopia.

Georgise, F.B., Thoben, K.D., & Seifert, M. (2013). Implementing the SCOR Model Best Practices for Supply Chain Improvement in Developing Countries. *International Journal of u-and e-Service, Science and Technology*, 6(4), 13-25.

Gonfa, B. (J2012). *Competitiveness of Ethiopian Shoe Industry: Response to Export Market*. Addis Ababa. Ethiopia.

Groover, M.P. (2001). *Application, Production Systems, and Computer-Integrated Manufacturing. Second Edition*. New Delhi: Prentice-Hall of India.

Hammer, M. & Champy, J. (1993). *Reengineering the Corporation: A Manifesto for Business Revolution*. New York, NY: Harper Collins Publishers.

Lukasinski, W. (2013). Self Assessment As a Source Of Knowledge In the Process Of An Organization Improvement. *International Journal Quality Research*, 7(3), 3–14.

Marwah, A.K., Thaker, G., & Gupta. R.C. (2014). Confirmation Study of Supply Chain Performance and Competitiveness of Indian Manufacturing Organizations. *International Journal Quality Research*, 8(1), 23-38.

Neely, A. (1999). The Performance Measurement Revolution: Why Now and What Next? *International Journal of Operations and Production Management*, 19(2), 205-228.

Porter, M. (1990). *The Competitive Advantage of Nations. London*. The Macmillan Press.

Sutton, J., & Kellow, N. (2010). *An Enterprise Map of Ethiopia*, International Growth Centre, Addis Ababa, Ethiopia

The Embassy of Japan in Ethiopia. (2008). *A Series of Studies on Industries in Ethiopia*, Addis Ababa, Ethiopia.

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ANNEX 1 PRESENT POSITION OF COMPANIES

Ron Basu and J. Nevan Wright (1997) categorized the performance level of companies as laggers, plodders, structuralists, behaviourists, and leaders (see figure 1). Leaders must have high scores in their secondary and primary pillars in order to compete with the world class manufacturers. Behaviourist companies show high score in secondary pillars and relatively low scores in primary pillars. With a structured improvement programme towards higher performance levels they can reach the leaders category. Structuralist companies are characterized by high score in primary but a lower score in secondary pillars. These companies appear to be ahead in the game, but in the longer term they are not likely to sustain their performance advantages. In order to move towards the leaders' category they will need to invest in time and resources in best practices and training. Plodder companies possess medium

scores for both secondary and primary pillars. They may have potential but they lack both performance and practices to compete in the world stage. They will require longer-term improvement programme with significant changes to their company policy, operation and practices. Lagger companies are the lowest scoring group in both practices and performance.

ANNEX 2 IMPROVEMENT CATEGORIES

Focused Improvement - this type of improvement may not appear to be radical but it is achieved within a short time scale and very often without any significant capital expenditure. Such changes are also relatively easy to implement and therefore form a big part of the company's cost effectiveness programme.

Continuous Improvement - the application of total quality, flexible working practices and total productive maintenance are examples of the continuous improvement category. These types of programmes are invariably company wide, requires cultural change over a long period.

Focused Restructuring - focused restructuring often aims at combining activities and departments. Such major organizational changes resulting from an acquisition or site closure may require an immediate down-sizing or structural re-organization. Focused restructuring often aims at combining activities and departments.

Process re-engineering - business process re-engineering results in strategic changes with a deep time horizon and is achieved by redesigning the core processes of a business. The choice of a particular improvement approach should depend on a company's specific requirements and commitments.

ANNEX 3 TOTAL PROBLEMS OF THE COMPANY

Understanding the marketplace - the company is not aware of the market size, market share and the trend of the market. The company knows a little about the needs of its customers (and their geographic, demographic and psychographic information), the different distribution channels, promotional efforts and the existing global opportunities and threats.

Understanding the competition - the company has little knowledge about the strengths and weaknesses of their competitors such as the level of their operation, their expansion programs, their competitive advantages, market share, relationship with customers, advertising plan, price, distribution, product/service features, and financial strength/cost position. The company also know only some about new entrants.

Product and Process Innovation - the effort of the company in searching for new products and improving the quality of the existing products is low. There is no analysis of a product life cycle. There is no involvement of marketing, R&D, manufacturing, and sales departments for product design. Product and process designs are not executed side by side.

Manufacturing Resources Planning and Working with Suppliers - production is not well realized in terms of quantity, quality, delivery time, methods, and cost of production. The company lacks a system that executes aggregate production planning, master production scheduling, materials requirement planning, inventory planning, capacity planning, and manufacturing control (shop floor control, inventory control, quality control) activities. Suppliers are not involved in the materials planning and processing activities.

Distribution Management and Working with Customers - the company has no defined and trustworthy distribution strategy, materials handling and storage systems, stock management scheme, and transport planning. The company has lost partnership with its customers, they are not considered to be an integral part of the supply chain.

Supply Chain Performance Measurement - the criteria for supply chain performance measurement are not used properly and workers are not aware of them. Stock turn, planning efficiency, asset turn, on-time delivery, post-delivery performance, and customer service performance are some of the criteria.

Sourcing Strategy - There is only little attempt to applied manufacturing scheduling and as well inventory management techniques. No technical criteria have been used to select suppliers in order to increase competition among them. Techniques are not in place for aggregating orders, design collaboration, and coordinated forecasting and planning with suppliers.

Appropriate Technology - the employment of inappropriate technologies (processes, machines, unskilled and inexperienced labor, old techniques and systems) and a gap in their management caused the wastage of resources and the generation of scraps. The company faces challenges to convert some customer needs into product specification and process parameters.

Flexible Manufacturing - the company tries to manage variations in volume, products and customer services by investing in raw materials, work in processes and finished goods with large manufacturing lead time and poor capital utilization. Much have to be done to employ machine flexibility, systems flexibility, product flexibility, routing/layouts flexibility, volume flexibility and production flexibility.

Reliable Manufacturing - footwear products require proper design and construction to offer the function they are intended to provide. However, due to the absence of reliability and quality methods, the company suffers from high cost of maintenance (due to cost incurred by labour, materials, downtime, scraps, lost sales and low product quality). The company follows breakdown maintenance system.

Manufacturing Performance - manufacturing performance have been evaluated in terms of effectiveness (attaining objectives) and efficiency (cost reduction). Due to the low performance in its effectiveness, the company has low income. There is low labour, materials, machines and overall efficiency. The internal manufacturing effectiveness of the company (planning efficiency and product quality) and the external effectiveness (customer service and product quality) are not well attained. The company is not strong in using work study techniques for improving manufacturing performance.

Product safety - raw materials (such as leather) is somehow tainted with certain toxicological hazards. There is product damage during transportation, storage and overload packaging. Few of the products are influenced by the level of chemical residues and the presence of nails.

Industrial safety – there is lack of awareness of ergonomics and due to this workers faced different injuries. Environmental factors such as temperature, light, dust, fumes, and noise are not maintained to the level of their appropriateness for the workforce. There is no good industrial relation between employees and employers, such as between line managers and supervisors and between supervisors and operators. There is inadequate learning programme on industrial safety.

Environmental Protection - the company has no reliable mechanism to protect the rejections of industrial wastes to the environment.

Quality Management - the company didn't implement TQM practices. Quality is not taken as the task of everyone. There is no quality targets defined and displayed at work centers. The company has poor customer/supplier relationship internally and externally. There is no focus on preventing the costs of non-conformances. The application of SPC tools to identify and remove the cause of quality problems is not in place. There is no documented standard procedure for processes.

Financial management - working capital of the company is not well managed. Return on

investment is very low. There is wastages of materials, low labour productivity, high overhead cost, low asset utilization, slow order processing, and ineffective planning and inventory control. Manufacturing managers know very little about financial parameters and product cost structure. Financial ratios are not interpreted for performance evaluation and decision making.

Information Technology and Systems - production and materials management, product development, manufacturing processes, sales and customer services, office works and finance activities are not supported by IT applications. The company uses traditional communication schemes within its supply chain.

Management Skills and Organization - organizational structure of the company is based on functions. This caused lack of team based order processing, poor communication and cooperation among departments, awkward working culture, and unnecessary delays of processes. The lower level workers are forced to execute the plan made by their bosses. Managers don't have sufficient technical and managerial skills to lead the company. There are no performance based reward systems in the company.

Flexible Working Practices - due to the less impetus of job flexibility of workers; there is low job satisfaction, low commitment, and more turnovers. Workers are not encouraged to become multiskilled. There exists a traditional barrier between functional areas. No workforce appraisal system is used to promote workers.

20. Continuous Learning - there is inadequate on-the-job and off-the job learning strategy, formal in-house education and learning programmes. There is no practice of training its employees for multi-skilling and autonomous maintenance. The company has insufficient learning resources in terms of full-time training staff, facilities and learning materials.