



Application of Total Quality Management to Bani-Whalid Textile Factory

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Abstract In this study, an analysis of the impact and development of Total Quality Management (TQM) was presented at Bani-Whalid Textile Factory (BTF) in Libya. Some parameters such as leadership, supplier quality management, vision statement, plan, evaluation, process control and optimization are analyzed to determine whether the current BTF quality management process is well organized. Based on the discussion of the interview with the company's senior management and managers, the results indicate that communication and knowledge transfer among workers is limited, and senior management is not yet enabled, and the computerized information system does not exist because of its pursuit of immediate profits and short-term benefits. as a conclusion, modern TQM operating practices are not applied to the plant as a complete package of the TQM operating model. So the company can identify areas that need urgent development using this model.

Keywords: Bani-Whalid Textile Factory, leadership, supplier quality management, vision and plane statement, evaluation, employee participation, costumer focus.

تطبيق إدارة الجودة الشاملة على مصنع بني وليد للأقمشة

*خالد عامر علي عامر و ياسر فتحي نصار و عبدالعزيز يوسف حصن و مسعود علي فاخر و أبوبكر الأطرش

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المخلص في هذه الدراسة، تم تقديم تحليل لتأثير وتطوير إدارة الجودة الشاملة (TQM) في مصنع بني وليد للأقمشة (BTF) في ليبيا. يتم تحليل بعض المعلمات مثل القيادة وإدارة جودة الموردين وبيان الرؤية والخطة والتقييم والتحكم في العمليات والتحسين لتحديد ما إذا كانت عملية إدارة جودة BTF الحالية منظمة بشكل جيد. بناءً على مناقشة المقابلة مع الإدارة العليا والمديرين في الشركة، تشير النتائج إلى أن الاتصالات ونقل المعرفة بين العمال محدودة، وأن الإدارة العليا لم يتم تمكينها بعد، وأن نظام المعلومات المحوسب غير موجود بسبب سعيه لتحقيق فوري الأرباح والمنافع قصيرة الأجل. في الختام، لا يتم تطبيق ممارسات التشغيل الحديثة لإدارة الجودة الشاملة على المصنع كحزمة كاملة من نموذج التشغيل لإدارة الجودة الشاملة. حتى تتمكن الشركة من تحديد المجالات التي تحتاج إلى تطوير عاجل باستخدام هذا النموذج. **الكلمات المفتاحية:** مصنع بني وليد للأقمشة، القيادة، إدارة جودة الموردين، الرؤية، التقييم، مشاركة الموظفين و التركيز على العملاء.

I. Introduction

Total Quality Management (TQM) has become a useful strategic tool for companies to achieve competitive advantage. This is the result of the improved and maximized use of the companies' resources towards the application of quality.

An extensive effort has been reported regarding TQM worldwide including tritcale study, for instance, [9]. On the basis of this cooperation, Total Quality Management is no longer a new term in business circles. According to [1] it is the integration of key business processes from suppliers to the end user that provides products, services and information that add value, inter and intra organizational communication and cooperation focused on specific sets of customer centered activities. [7] claims that TQM has been widely applied throughout the world. Many firms have arrived at the conclusion that effective TQM application can improve their competitive abilities and provide strategic advantages in the marketplace. Several researchers [3] also reported that TQM application has led to developments in both quality and productivity, as well as competitiveness in only 20-30% of the firms that have applied it. A study conducted by [8] indicated

that a 90% development rate in employee relations, operating procedures, customer satisfaction, and financial performance is achieved due to TQM application. However, [4] reported a 95% failure rate for initiated TQM application programs; [2] reported that TQM application has uncertain or even negative effects on performance. [3] indicated that achieving high product quality and pursuing successful TQM application are highly dependent on top management support. However, [8] reported that there is no association between top management support for quality, Quality and the level of product in cooperation quality and quality achieved. Many researchers suggested that effective product design can lead to the development of product quality and quality [3], whereas [8] reported that there is no relationship between systematic product design and the level of product achieved. Thus, conflicting research findings have been reported surrounding the effects of TQM application on overall business performance. It includes many different areas where it is possible for companies from all different business branches to improve their performance. In today's global market, more and more companies

realize that the performance of their businesses depends largely on external collaboration and coordination across the quality. [6] as members are primarily concerned about their individual interests that may not contribute to the overall quality performance; their decisions may result in an inefficient network system with problems like high costs, compromised customer service and a weakened strategic position.

The aim of this study is to analyze the impact of the performance measurement and development of quality processes in the BTF firm in Libya and attempt to develop a TQM application model that can be used by Libyan manufacturing firms.

II. The Research Methodology

Based on the current TQM application in BTF firm, this research aims at achieving the following research objectives:

To develop a TQM application model in BTF firm in order to guide Libyan manufacturing firms in implementing TQM. Thus, new knowledge related to TQM application in Libyan manufacturing firms can be derived. In this research, new knowledge is generated from the existing TQM knowledge integrated with specific characteristics, top manager, middle manager and the average score between them. After reviewing the existing TQM literature, it has become very clear that this research project is the only one that systematically examines the effects of TQM application in Libyan manufacturing firms. In addition, this research attempts to develop a TQM application model that can be used by Libyan manufacturing firms.

III. An overview of Bani-Whalid Textile Factory (BTF)

Wool textile complex for woven and tufted carpets, knitted garments, and blankets at Bani-Whalid can be considered as one of the Libyan biggest companies in the recent years, its major strength being in classic products; Lab ad "80% wool, 20% polyethylene"; wall carpets; double thickness carpet and woolen garments such as sweaters, pullovers, gloves, and scarves. A contract was signed on 23/7/1979 between Libyan government and a group of German companies to build this factory in a space of almost 10.5 hectare in the city of Bani-Whalid, about 180 km from the capital Tripoli. The factory started its real production stage in September 1983. The aim of the factory was to utilize the wool, which is available in huge quantities in Bani-Whalid and the nearby cities, and it does not cost much money to cover the northern and southern cities. The first phase of the factory cost 30 million Libyan Dinars "LD" (approximately US \$ 22 million). The factory is located near the coast to facilitate export activities by sea into international markets.

The factory makes different types of products for which wool is the main raw material. The factory has staff headcount of about 2270 as shown in Table 1.

Table 1: Headcount at BTF

Number	Nationality
310	Foreign (India, Turkey)
720	Arab (Tunisia, Morocco, Syria...)
1130	Libyan

Source: 'BTF' marketing catalogue 2011.

A. buying and ordering the raw materials

1. The factory buys its raw wool directly from farmers and sheep projects that belong to the government. These projects are in the middle region of Libya, which Bani-Whalid is a part of, and can be considered as rich source of wool compared with other parts of Libya.

2. The factory satisfies its needs for plastic, polyester, PVC, plastic pipes (on which carpets are rolled) and Gout file locally from other Libyan factories such as Abukmash Petrochemicals; Ras-lanoof Poly-propylene factories, Soq-alkhames and Al-swani Plastic factories. These elements are always available in huge quantities because they mainly come from oil.

3. The factory imports glue, cotton files and special liquid for making thickened glue (which is used in Ajme carpet manufacturing). These elements are imported from Europe. However, to avoid the shortage of these imported materials the factory always keeps extra amounts of them for emergency cases. The following Table 2 shows the required raw material in 2011.

Table 2 The required raw material in 2011 (Othman, 2011)

No	Item	Amount	Unit	Price per Tone LD
1	Raw wool per year	6.260	Tone	750
2	Gout file per year	130	Tone	130.000
3	Cotton file per year	70	Tone	210.000
3	Mokit carpet file per year	500	Tone	2 million
5	Triko file per year	90	Tone	530.000
6	Poly propylene file per year	250	Tone	300.000
7	Nylon file per year	200	Tone	350.000
8	Glue to cover the woven per year	1.260	Tone	_____

IV. Results and discussion TQM Application

This subsection presents the weak areas of the factory's TQM application and the reasons leading to these weak areas depend on the assessment tool. The weak areas identified could be used by BTF to further improve its TQM application; they were regarded as potential development possibilities. Note that the identification of these weak areas was on the basis of unbiased, honest, and fact-based judgments.

Leadership

There was strong evidence that top management empowerment had not been applied in the firm. The BTF was centralized and hierarchical, and there was a strong tendency for employees to do things according to what they were told. They tended to wait for guidance from top managers or supervisors at all times. Thus, employees did not take any risk or responsibility if things went wrong; otherwise, they would be punished or fined. If things went wrong, employees tried to seek excuses to protect themselves in order to avoid being fined or criticized. Employees did not want to take any risk by doing things without

permission. Top management did not pursue long-term business success but focused instead on annual business success, which was their most important goal. Top management still viewed TQM as less important than product quality and cost. In addition, top managers often organized discussion meetings after quality problems or delivery problems had happened; how to prevent problems from happening was not given sufficient attention. Top managers were reluctant to accept or implement employee suggestions if money was needed for their application. The factory's many problems occurred due to its focus on immediate profits or short-term benefits. The results shown in Fig. 1 are based on the interview. They found that the top management empowerment had not been applied in the firm. The first column lists the addressed areas that may affect leadership satisfaction. A number between "0" and "10" is used to score leadership satisfaction level. The number "0" means that leadership is extremely unsatisfied with the area and the number "10" indicates they are extremely satisfied with the area.

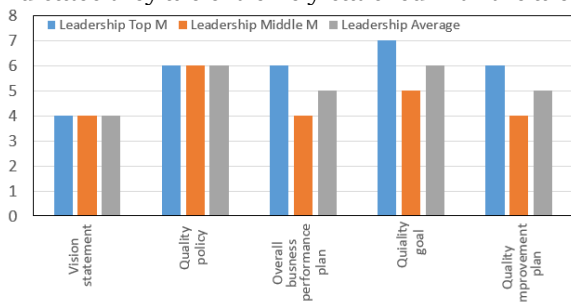


Fig. 1. Leadership

Supplier Quality Management

Long-term partnership between BTF and its suppliers had not yet been established. BTF had a special policy of rewarding purchasing personnel who could purchase products without immediate payment or less immediate payment. This was due to the shortage of capital. Otherwise, BTF could not have sufficient materials to maintain normal production. Such practices caused the problem that the firm would have to pay more in the future. If the buyer cannot pay immediately, the purchasing price is always higher. One interviewee said that it was very difficult for BTF to organize production. For example, after a contract was signed, the customer generally paid approximately 20% of the product's selling price in advance. After receiving the product, the customer would pay another 70% of the payment. The remaining 10% was used as a guarantee deposit. If the product had quality problems, the customer would use the deposit for delay, and so on. Thus, the firm did not have much money available to purchase products from suppliers. In total, BTF owed its suppliers approximately 10 million LD. BTF always received complaints from its suppliers. Due to the lack of partnership with suppliers and as well as mutual trust, BTF had to implement strict non-value added incoming inspection. Purchasing price was the most important factor in selecting suppliers, with quality falling behind the price. Such a practice indicated that BTF selected such a supplier that

could provide the lowest price for suppliers. In a few cases, purchased products could not be accepted technically. For example, qualified suppliers of gears carpet roll at 6 dinars per meter could be provided if the buyer paid immediately. However, BTF selected a supplier that could provide the service at the price of LD 3.5 per meter and did not ask the firm to pay immediately. Thus, it is not difficult to imagine what happened to the factory's quality. Since it considered price the first priority in selecting suppliers, quality problems inevitably happened during the process of production and in the operation of the final products. In fact, many of factory's qualities occurred due to poor purchased products. The results shown in Fig. 2 are based on interview. They found that the firm did not have much money available to purchase products from suppliers. A number between "0" and "10" is used to score supplier quality management satisfaction level. The number "0" means that supplier quality management are extremely unsatisfied with the area and the number "10" indicates they are extremely satisfied with the area.

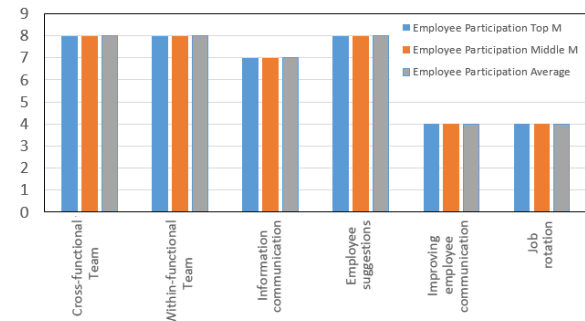


Fig. 2. supplier quality management

Vision and Plan Statement

BTF had a long-term vision statement that had been drawn up several years ago. However, many employees were not clear as to what the vision statement was. In fact, BTF did not use it as a guide in formulating its business strategies. In this regard, the general manager did not have a clear long-term vision. The reason for this was that the general manager had been appointed by the administrative to run BTF on a short-term basis, based on a contract. If he performed well, he would stay in the position longer. The decision made by the department in this regard was highly dependent on factory's annual business performance. Therefore, the general manager focused on yearly business performance rather than long-term business success. His target was to accomplish the yearly business performance indices assigned by the administrative department. To do so, BTF had a yearly policy statement to guide it in doing business. These yearly policies varied year to year depending on its internal and external environments. Before these policies were in force, they had to be approved by the workers' congress. The yearly policies were well communicated to employees at different levels. BTF did not have long-term overall business performance plans. Instead, it had only yearly strategic business performance indices and quality

goals, which were formulated based on the assignments set up by the administrative department. This was because top management placed too much emphasis on short-term objectives. Although these plans were also presented to the workers' congress for discussion, they would not be changed since they had been set up by the department. BTF did not have specific plans regarding which levels of employee and customer satisfaction should be reached. BTF actually drew up its quality development plans in terms of quality problems that it had. The information used in making the plans was mainly from customers' complaints and its different departments or workshops. It was evident that quality development plans were easily applied if little money was required; it would be problematic if much money were needed. In this regard, BTF did not provide sufficient resources for implementing quality development plans. The primary reason for this was that BTF tried to achieve cost reductions to maintain its profits. Thus, BTF general manager could survive. The results based on interview are shown in Fig. 3. They found that the many employees were not clear as to what the formulation of vision and plan was and the firm did not provide sufficient resources for implementing quality development plans. A number between "0" and "10" is used to score vision and plan statement satisfaction level. The number "0" means that vision and plan statement are extremely unsatisfied with the area and the number "10" indicates they are extremely satisfied with the area.

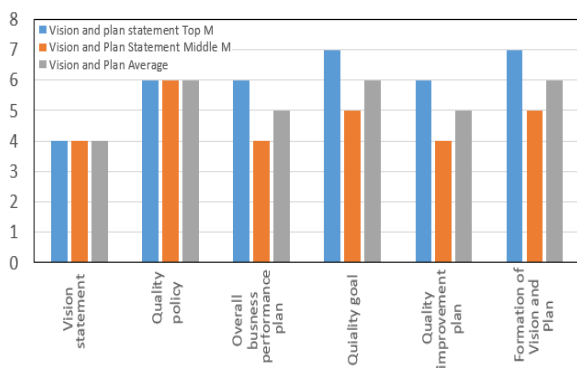


Fig. 3. vision and plan statement

Evaluation

The TQM application model was used in evaluating the factory's TQM application practices and overall business performance. The author conducted the evaluation guided by the assessment tools. Although BTF tried to improve a number of job-related facets that might affect employee satisfaction, the employee satisfaction level as a whole remained unclear to some extent. In fact, BTF did not evaluate its employee satisfaction and did not have employee satisfaction data. In this regard, the issue of employee satisfaction did not receive much attention from BTF. This was because it was easy to recruit new employees from the labor market. Furthermore, BTF already had a redundant workforce, which it considered a heavy burden. Competitive benchmarking with its major competitors was not

conducted by BTF. Thus, TQM application and overall business performance of its main competitors remained unclear to a certain extent. Thus, BTF lost opportunities for further development of its quality of products and services. In fact, this practice had actually not caught top management's attention. The data on appraisal costs and prevention costs were not available. The firm mixed these two types of quality costs with its normal overhead expenses. Thus, it was not clear as to how much money was spent on appraisal and prevention. It is no doubt that BTF spent a great deal of money on various inspection activities, as it had approximately 30 specialized inspectors. Many inspection activities were actually non-value added. In fact, the availability of appraisal costs and prevention costs was valuable to BTF in formulating effective development actions so as to reduce these costs. BTF did not have an integrated computerized information system for collecting, processing, analyzing, disseminating, and storing relevant information. Information technology remained at a primitive level. Thus, it was difficult for different departments and workshops to share their information. Its major information flow was through handwritten documents. Therefore, working efficiency was low and some problems occurred due to the poor information system. BTF did not have such a computerized information system in place due to its pursuit of immediate profits and short-term benefits. Based on the evaluation, the current situations of the factory's TQM application and overall business performance were obtained. The evaluation results as showing in Fig. 4 indicate that the different scores with columns depend on specific characteristics, the first column lists addressed areas that may affect Evaluation satisfaction. A number between "0" and "10" is used to score evaluation satisfaction level. The number "0" means that evaluation is extremely unsatisfied with the area and the number "10" indicates they are extremely satisfied with the area.

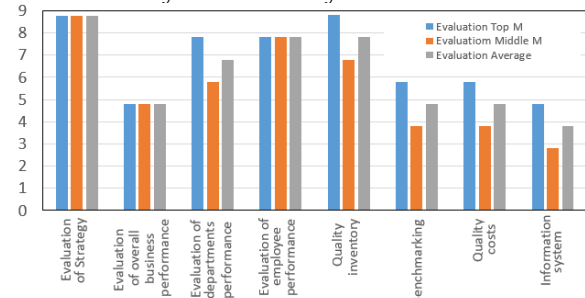


Fig. 4. Evaluation

Employee Participation

Employees did not have any intention of reporting their own working problems because they were afraid of being fined or laid off. As a result, BTF lost many opportunities for quality development. In fact, employee working performance was highly related to monthly pay. If employees had their own working problems, they would be penalized according to the factory's penalty rule. BTF did not implement the system of job rotation as many working posts required operators with special qualification certification to

do. Such regulations were stipulated by relevant governmental agencies. For example, operators cannot operate cranes without qualification certification. Due to the money limitation, it was impossible for BTF to send many employees to different special job training activities. Therefore, employees lacked multi-disciplinary skills. Based on the interview the results are shown in Fig. 5. They found that the improving employee commitment and job rotation were not clear as to what the cross-functional team and within-functional team was and the firm did not provide sufficient resources for worker’s congress. A number between “0” and “10” is used to employee participation satisfaction level. The number “0” means that employees participation is extremely unsatisfied with the area and the number “10” indicates they are extremely satisfied with the area.

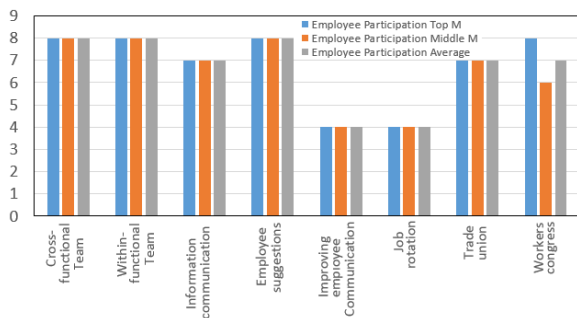


Fig. 5. employee participation

Customer Focus

BTF did not fully conduct market investigation. For example, designers hardly went out to collect information for improving product design due to the lack of money. Designers also rarely visited customers in order to understand the performance of their products on site. Thus, information sources used for product design were very limited. Designers only made use of customer complaint information and customer requirements specified in contracts for designing products. Customer expectations, future requirements, and competitors’ offerings remained unclear to a certain extent for designers. How to delight customers was not the focus of designing products. BTF did not have customer satisfaction information on the quality of products and services from its competitors. Thus, customers’ views on the factory’s competitors were unclear. In fact, such information would have been valuable to BTF in further improving its quality of products and services. The first column lists addressed areas that may affect Customer Focus satisfaction. Based on the interview the results are shown in خطأ! لم يتم.

They found that the market investigation and customer satisfaction survey were not clear as to what the quality warranty was and the firm did not provide sufficient resources for customer information system. A number between “0” and “10” is used to score Customer Focus satisfaction level. The number “0” means that customers focus is extremely unsatisfied with the

area and the number “10” indicates they are extremely satisfied with the area.

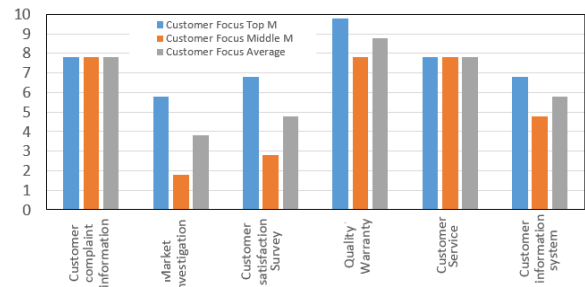


Fig. 6. customer focus

V. Conclusion

This model shows that the application of these TQM practices in combination can lead to developments in overall business performance. In order to assist users in applying this model in practice, the processes of its use and the guidance of formulating the development plan are presented.

Based on the evaluation, the strengths and weaknesses of the factory’s TQM application were identified. The factory’s current TQM application practices showed that in the TQM application the full package was not used as a model. It is better to say that this factory only applied a part of TQM. The weaknesses of the factory’s TQM application provided opportunities for BTF to improve its TQM application. The factory’s deputy general manager agreed that BTF would implement this development plan in practice. Thus, it can be concluded that this TQM application model can be used to evaluate the factory’s TQM application, identify strengths and weaknesses therein, and assist the factory in formulating the development plan. Therefore, the TQM application model developed in this study is applicable to this factory. What is more, this TQM application model can be used in other Libyan manufacturing firms. In fact, the case study was conducted in only one Libyan manufacturing firm. The case study further shows that this TQM application model can be used to benchmark firms’ continuous development, self-assess their quality development efforts, and measure their progress over time. Through using this model, firms can quickly identify which areas urgently need development. Thus, resources can be allocated more wisely. In fact, TQM application is a systematic approach. No universal standard of TQM application exists. A firm should not follow the practices presented in this TQM application model strictly; when they start using it, they should combine their uniqueness with the practices of this model and consequently develop their own models and ways to excellence. Their own measurement systems can better fit their situations. This case study also provides an example of how to use this TQM application model in practice. Firms that want to use this model can take this case study as an example. In fact, implementing TQM is a continuous development process. It is a never ending journey. Implementing this model does require patience, tenacity, and commitment from people at every level in BTF. It will take some time to see the effects of implementing this model. These

results show that the factory's TQM system is not perfect but that has an ability to improve and do so indefinitely and this is exactly where the truth of the following quote lies: "there is always room for development it's the biggest room in the house.

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