

Achieving Quality in Woven Fabrics by Using Reengineering System

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Research Summary:

The textile industry is one of the most important demotic industries, where Egypt has a lot of potential and relative advantages that qualify the State to compete the international textile industry. However, Egypt could not able to transfer its comparative advantages to competitive advantages that are based on Change and development constant for factors of production through knowledge and technology in order to maximize the value added has also become immune to the comparative advantages that are based on static factors of production. Therefore, this industry requires a lot of study and planning to be able to compete and penetrate the world markets, this cannot be achieved only by the applying international quality systems to solve the problems of our local industry and change the philosophy used in the management and prioritize them to control the cost and structuring the administrative system within companies applying the system without destroying them to catch up with the international industry, which preceded us in these concepts for decades. These systems include reengineering operations, which is not only used in manufacturing and production, but also for the entire industrial enterprise to change the culture of the whole enterprise by managing the industrial resources in a tight manner in a precise manner in which the data and information are clearly and easily available among the different departments of the company. Ware housing, procurement, sales, customers and even suppliers as a major part of the company.

It has been implemented by Apple co., Nokia Co., and Kodak, but it has not been applied in the textile industry, to overcome the national industry problems that the system had the ability to solve and eliminate all such problems in other industries. The search was titled as (Achieving Quality in Woven Fabrics by Using Reengineering System).

Research problem:

Textile industry faces many local and global challenges recently such as:

- High prices of yarn and energy as well as utility cost which limit the ability of factories to modernize production lines.
- High inflation of labor which leads to increase the cost price, the accumulation of debts to companies and the imbalance of the financing situation for state companies of textile garment.
- The deterioration of some of factories, specifically for public business sector due to the technical obsolescence of machines, the low level of labor and their inabilities to keep up with advanced technologies, the lack of scientific management which supposed to apply rewards and sanctions and the adoption of ineffective methods of management and production.
- The limited Arabic scientific studies of textile related to re-engineering process.

Keywords: Reengineering- Restructuring – Automation.

Importance of research:

The existence of using the system of re-engineering process in order to enhance the performance of the quality system in the textile factories with the study of intellectual and philosophical framework of the system returns back to its global capability to enhance the efficiency, to raise performance level within the global institutions and to face the changes of these organization.

Research Target:

1. The achievement of radical change in performance through changing methods and tools of work and results.
2. Reducing costs by eliminating unneeded process and focusing on value-added process while improving the quality level of different processes and stages within the industrial corporation.

Research hypothesis:

1. Application of Reengineering system, including the prevention of any loss, will raise the production and reduce the percentage of the defects therefore, will reduce the cost of the final products and prices.
2. Application of Reengineering system, including respect for individuals, will lead to employment stability, high standard quality of performances and will the improve work environment as everyone will work within the system,
3. Application of Reengineering system will achieve client requirements and will increase the competitiveness of the company.

Research methodology:

The research follows the analytical experimental methodology.

Research theoretical framework: System of process reengineering:

Davenport defined process reengineering as a process consisting of a set of structured measurable activities designed to produce a set of outputs for a given market or a group of clients. Champy defined it as a set of activities that uses a particular type of inputs in order to produce outputs of a significant value for a particular group of clients. Hipkin defined it as a set of structured measurable activities that uses a necessary resource in order to produce a particular type of goods and services for a particular group of clients.

Company database (subject review):

- Number of employees: 345 workers.
- Standardized products of the company (subject review): textile fabric for upholstery work of salons and guest rooms.

First: Area of study:

The system and proposed program have to be applied within the company as a whole.

Second: study charter**Table 1 study charter (the project)**

Elements	Statement
Study objective	<ol style="list-style-type: none"> 1. Reduction elimination of disrupting production 2. Improving the specification of fabrics. 3. Improving work environment and employment stability (all of this to achieve the objective of applicable system).
Team members	<ul style="list-style-type: none"> • Representative of senior management: chairman of the board. • Steering committee: quality manager\ director of design and marketing\maintenance manager \director of administrative affairs and human resources. • Coordinator: factory manager\ researcher \ workshop leader\ textile manager. • Workshop members: head of textile shift\ storekeeper\ maintenance technician\ preparation technicians.
Timetable	<ol style="list-style-type: none"> 1. Identification and definition of the problem (August 2018). 2. Measuring the problem (October 2018). 3. Problem analysis (October to November 2018) 4. Solution of the problem (January 2019). 5. Measurement after the solution and controlling the problem (January to February 2019)
Potential impediments	When the senior management doesn't commit to make the required changes for applying the system.

First stage: identification of the problem.

1. The high rate of machine failure.
2. The preparations and quantity of the second degree(severe defects)
3. The low level of work environment and instability of employment

Second stage: measuring the problem (Data collection)

1. Measuring the problem of the high rate of machine failure: Total machines failure in the company from 1 of September to 30 of October was 20, 9% which caused reduction of production machinery, including many losses, delaying in delivery orders to customer on time and increasing in the level of client complaints.

The third and the fourth stage: Brainstorming, analysis of reason and effect, suggestion and application of solutions.**A_ Nutrition:**

- 1-Existence of routine and preventive maintenance in order to adjust the mechanic parts to suit each category
- 2- Model preparation of the four shift system in the company where the worker has to maintain presence for two days; morning shift then noon shifts then two more days for night shift and then for two days off.

A system has been developed which makes the worker, who has an excuse, convince one of section personnel to compensate for his absence then both of them should inform the head shift. This will help to reduce the percentage of the absence.

Kanban card system which shows the need of production stages through the draw system. Every stage is marked with a card on the machine indicating its requirement from the previous stage of inputs, a member shall follow up within the stage when Head shift is supposed to prepare and follow up with the members for every two hours. The daily production tracking form for different stages and daily holidays, order model of functionary an item and card model of product specification.

3- A training course was prepared outside the company for product manager under the heading of development system of production in order to upgrade his efficiency and to understand his requirement of modern systems based on the process of pulling the production not on bushing it, how address the problem of production and the management of a successful team Therefore training head shift on the program within this company to assist him in application process.

B_ Maintenance:

1-Appointing other maintenance engineers in order to have maintenance engineer for every shift to follow up on mechanical controls and maintenance personnel to solve the problems that cannot be solved by the personnel.

2- The presence of one of the maintenance engineer with procurements during latter of assist for spare parts and receiving it to ensure their efficiency and conformity to what machines need.

C_ Defects of preparations:

1- Enhance capacity and awareness of workers to assure the safety of the previous stage before starting this stage by attending the training program for production workers and the existence of quality nutrition for the production worker who is supposed to count the defeats rate that result from defeats of the stage to make him feel that his salary depends on his performance.

2- Develop a system to demonstrate work system within the production department to clarify work policies within department to have a permanent and clear contact within the other departments and to prepare a new functional specification of a new item.

D_ lack of spare parts:

1- Evaluate of the performance of spare parts suppliers from the maintenance and procurement manager and the quality manager in order to select the suppliers of highest quality and the nearest ones or who have the ability to supply on time.

2- Prepare a gradual step to reduce the inventory because there is no need for a large part of it and the difficulty to access some of spare parts needed for production and this inventory is a cover for many defects, where firstly there is a control and inventory of spare parts located in the store then arrangement and encapsulation for each item and prepare a card for each category to access them easily when they are needed.

E_ Electricity:

- 1- The existence of routine and preventive maintenance to ensure the control on the efficiency of the mechanical parts on time.
- 2- Upgrade the efficiency of maintenance personnel to have the ability to solve technical problems to reduce the time of machine breakdown according to the training program entitled (Modern maintenance mechanisms).

2_ The problem of high proportion of second-rate (severe defects):**A_ Mat up defect:**

- 1- Educate the weavers and the quality monitor to follow up the rate of stress on the lock every day and when changing the switchblade.
- 2- The existence of routine and preventive maintenance to adjust the mechanical parts and modify it to suit each category.
- 3- Follow up the quality of the recycling phase of the company through the performance monitoring report of the recycling machine.
- 4- Making a system of cleaning the machines and production halls and training staff in all departments on it. Personnel quality should follow up the level of cleanliness of machines and this will be as one of the elements of quality evaluation of salary. This system has been prepared by the Director of maintenance and quality where the cleanliness will be a daily routine for every weaver.
- 5- Dealing with a supplier who supplies the tubes used directly in yarn dyeing (It eliminates the two stages of fumigation after dyeing. This is done concurrently with the dye stage and the stage of recycling the hard) which are called Flex Bravo tubes. These tubes are characterized by the possibility of increasing the intensity of the yarn during the dyeing stage by 30% than the tube of traditional plastic color and thus the productivity of the dyeing stage will increase.

B_ Double end defect:

- 1- Having quality monitors through the fabric stage and working on a report for the quality control and knowing the defects.
- 2- Upgrade the efficiency of maintenance personnel to have the ability to solve technical problems to reduce the time of machine breakdown according to the training program entitled as Total Productive Maintenance (TPM) and for the heads of maintenance departments under the title of (Advanced Total Productive Maintenance, quality control in textile factories) and Some of maintenance personnel were also trained and turned into basic maintenance personnel.
- 3- Upgrade workers' awareness of the importance of different types of rapier looms.

3_ The problem of deterioration of the level of work environment and employment instability:**A_ The low level of work environment:**

- 1- Review quality, maintenance and production in order to prepare a system to follow up the cylinders of raw materials because of its vital role in the deterioration of the working environment within the factory, prepare a statement for measurement of humidity,

temperature and ventilation which should be followed up by maintenance personnel every 2 hours to ensure their conformity.

2- The existence of a clear loading plan monthly and annually, preparing of plan to follow up the models within the production halls and machinery loading on the employment of production then returning back to worker's capacity.

B_ employment instability:

1- The restructuring of the salaries of the company according to the skills of each individual within training courses for employees in order to upgrade their efficiency to convert numbers of assistant labor to basic labors for the stages of production where the worker won't exist for two shifts which causes the absence or delay of the worker on the following day. Hold a monthly meeting to analyze the monthly results of production performance and quality and discuss the problems of workers.

2- The presence of an official for each cycle to make a schedule for the arrival of the bus to each station and notify the passengers line and the driver by the date of arrival of each station and the date of departure without delay, and having conclusion of annual contracts with drivers, under the condition of avoiding the contract with the driver in case of repeated delay with giving t incentive For the most committed driver.

3- The approval of the senior management to rent a close residence for expatriate workers to the company in order to provide comfort for them and to avoid the absence and delay of expatriates which affects the production thus the senior management rented 3 apartments close to the company.

4- Preparing a weekly statement of employees and their weekly rest, the application form of their advance request, letter of resignation, certificates of courses, custody receipt and certificate of experience. Preparing a form of the business policy, personnel responsibilities and transfer order from one department to the other,

5- The fifth and sixth stages: Control problems to guarantee non-repetition:

1. Total defects before application of solutions are 20.9% and after applying solutions are 5.1%.

2. The difference between the percentages of the second rate before the application of solutions of the defect of **Mat up** is 2.77% after application of solutions is 0.05%, and before the application of the defect of **Double end** is 1.55% and after applying solutions is 0.02%.

Results:

1. It was found that the system is suitable for application in the form of specific projects in textile factories which leaves a significant improvement. The work has been improved and the efficiency of workers has been upgraded within this research.

2. The application reengineering system enhanced the working environment and also helped to improve communications between the various departments, the workers and senior management, which led to the existence of an integrated work system aims to customer satisfaction.

3. Application of the system led to reduce costs by reducing the quantities of the second rate and severe defects of production and thus increase profitability with the possibility of reducing prices and raise the ability to compete fiercely in the local and global markets.

Recommendations:

1. Using and developing the applied system of study in order to organize and reconstruct textile companies, increase their market share, upgrade their ability to compete, reduce defects and increase production of textile companies.
2. The participation and contribution of based- Industrial Modernization Center to introduce international quality systems to textile companies, including reengineering system and its ability to solve the problems that these companies suffer from, through training and upgrading the efficiency of their cadres.
3. The educational institutions should establish the importance of modern quality systems and their ability to solve the problems of industry in Egypt and the inability of traditional production systems to compete locally and globally.

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