

Effect of Total Quality Management in Resources Management of Egyptian Public Sector

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Abstract— This paper aimed to study the impact of Total Quality Management (TQM) implementation on resources management and its relationship with the satisfaction level and investigate the factors affect the institution performance.

Plan-Do-Check-Act (PDCA) technique was adopted in the improvement of the semester exam administrative procedure at the Faculty of Engineering at Helwan; as a TQM methodology.

It is recorded a positive relationship between resources management and customers satisfaction a result of the adoption of the PDCA technique. Therefore, saving time and money compared to the past is an important indicator as a direct result of research. Continuous improvement and considering customers feedback were a reason for saving wasted time 15.6% in 2nd cycle, reached to 33.3% in 3rd cycle, and increasing participants' reward to 40%, 50%, 60% during the adoption of three cycles, respectively.

It is concluded that; The Egyptian governmental institution needs more efforts to successfully implement TQM correctly. the employees' evaluation mechanism must be modified to reduce the resources waste occurred in Egyptian public institution.

Index Terms- Customer Satisfaction, Egyptian Civil Services, Job Satisfaction, PDCA, Resources Management, Services Institution, TQM.

1 INTRODUCTION

Total Quality Management TQM is the methodology for managing organization resources, people, time and business process to ensure the continuous improvement of the production of services. TQM is a management philosophy monitoring all the organization activities aimed at increasing business and reducing losses due to wasteful practices and focusing on total satisfaction for both internal and external customers[1]. The success of quality management practices, in manufacturing and industrial organization for improving their performance; encouraged service organization managers, in the private sector, to use TQM in their respective organization [2]. The success or failure of implementing TQM depends on the critical factors that must be practiced well to accomplish the goal of your business or project. these critical factors can be named as; continuous improvement, leadership, external customer satisfaction, people management, teamwork, process improvement, internal customer satisfaction, measurement of resources, and finally the competent administrative leadership is the backbone for implementing TQM methodology [3], [4], [5], [6], [7].

The number of employees of the state administrative apparatus approaching for 5 million almost; subject to the civil service law; they are earning 300 billion pounds annually and serving population numbers up to 99 Million, which is equivalent to one employee for every 17 citizens [8]. This indicates that we have a crisis, which has created a complex bureaucratic aggravation until it reaches us to sag administrative and inflation in the governmental system and mismanagement.

The Egyptian government has taken a step in the reform path; it was The Civil Service Law No. 18/2016. The Civil Service Law is, in theory, a step toward reforming Egypt's administrative apparatus, bureaucracy and ending an unsustainable

situation.

While the Vision of the administrative development sector, by 2030, there will be an efficient and obedient administrative system that will improve the management of state resources, transparent, fair and flexible, accountable, responsive, and responsive to the citizen. The sector has announced the application of European quality standards within the state administration [9]. However, there are problems facing the customer of the Egyptian administrative system which leads to a dissatisfaction state. There is a lack of quality culture between the internal and external customer of governmental services institutions. In this paper, a model proposed to find a way to reduces waste of resources and reach to high services performance and customers satisfaction in governmental public services institution in Egypt.

2 METHODOLOGY

The work methodology was divided into two stages; **the first stage**; collecting data from the sample of the study using different techniques. **The second stage**; three cycles of PDCA technique were adopted as a model in implementing some of the TQM principles.

2.1 Questionnaires Design and Data Collection

In order to evaluate the Critical Factors CF which affect the performance quality of the services, data was needed to collect from several resources; **primary data** collected by using questionnaires and personal Interviews. **secondary data** obtained from the institution's reports, reviewing previous researches, and online resources to ensure confidence in the data collected from the samples of research.

Questionnaires were written in the Arabic language as a mother language of the sample and then translated to English for the research aim. GOOGLE FORM used in designing an online survey, then it is submitted to an External Customer (EC) samples; like academic staff and students. Questionnaires divided into three sections; The first section addressed information of

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customers, It related to ages, qualification, and job position for the employee; email, job position, and scientific degree for teaching staff and their assistants. The second section consists of questions which measure the institution's performance, by measuring the degree of satisfaction of the practices within the institution. The third section is white space to express in short words about their suggestions and express their opinion about the issues which are not asked in questionnaires.

weak respondents numbers of questionnaire owing to; bad background on the questionnaire generated a state of distrust, low culture of the expression of opinion through it, and absence of feedback from previous questionnaires generated a state of useless questionnaire. These reasons make confidence in the data collected very low and make enterprise reports, and face-to-face interviews are necessary.

2.2 Implementation of TQM Concept

The proposed study adopted Deming Cycle (**Plan-Do-Check-Act**) PDCA which is a process approach for improving performance by continuous improvement to get the satisfaction of customers and emphasized the prevention of error recurrence by establishing standards and ongoing modification of those standards [5], [10]. PDCA is a cycle created for continuous improvement. In the planning phase, objectives and actions are outlined. Then, doing actions and implementing the process improvements. Next, check to ensure quality against the original. Finally, acting requires that was determined where changes need to occur for continued improvement before returning to the planning phase [11].

3 CASE STUDY

The Administrative System in the Faculty of Engineering in Helwan, Helwan University (FEHU) was chosen as a case study in collecting data and applying the proposed Framework. The case study was chosen as a sample of a governmental public, and non-profitable service provider.

3.1 The Critical Factor Affect the Institution Performance

This stage evaluated the Critical Factors affect the performance quality, by collecting primary data with designing several surveys to the institution members External Customers EC and Internal Customers IC and personal Interviews. Secondary data obtained from the institution's reports to ensure confidence in the data collected from the sample of research.

The External Customers are the recipients of the service; the output of system; which is provided by the institution employees; FEHU has several categories of external customers; namely, Students (undergraduate and postgraduate stages), teachers' staff and their assistant.

The Internal Customers are the employees of an institution, who are the responsibility for providing the service to the external customers or another internal customer. Accordingly, ICs could be considered as a customer for any department of the institution. Teaching Assistants Staff (TAS) were also considered as external and internal customers.

Like in any other research depends on people in collecting data, the participants of this study may not be honest in giving the information or may simply give incorrect information to please the interviewer. Refusal to participate in the completion of the questionnaire due to bad experience resulting from negative behavior from previous administrations in response to their views recorded in the questionnaire.

3.1.1 Data Analysis Outputs

During the analysis of collected data, the system was evaluated and described as shown in Fig. 1 the relationship between institution elements may be separated and not related to each other, as listed below:

1. A lack of management leadership members.
2. A training concept is not a priority of the system.
3. Customer satisfaction was not achieved and is not a priority of the system.
4. Absence of human resources management concept.
5. Job satisfaction was not verified.
6. Culture of quality was very poor.
7. Weak accountability mechanism, which affects the commitment of employees and thus the efficiency of service.



Fig. 1. Description of institution system stages.

As soon as the critical factors of the institution performance determined as a result of the first stage, a chosen process studied in the institution to examine the factors cause low-level service performance of the governmental institution. This process can be studied and evaluated as an integrated process, or maybe described as "A stand-alone process". It was the exam department, which is responsible for preparing the administrative work of the midterm exam and Final Exam twice a year. This process has a separate budget, that is calculated away from the salary. The exam process was mentioned negatively several times in the survey process during the first stage. Therefore, the exam process in the FEHU has been chosen as a case study in the second stage.

3.2 Adopting PDCA Cycles (TQM Technique)

Three PDCA cycles have been adopted to achieve improved performance. Figure 2. represents the concept of the model adopted in the research. The study period could be shorter and the three cycles reduced to one. But, the study faced many obstacles such as uncommitted management, resistance to change, misunderstanding, misinterpretation of regulations due to personal interests, low level of qualifications, and lack of training. The first cycle began with the evaluation of the system and the identification of factors affecting the performance of the process and the level of customer satisfaction, in three separate semesters during the period that started in May 2017 until May 2019.

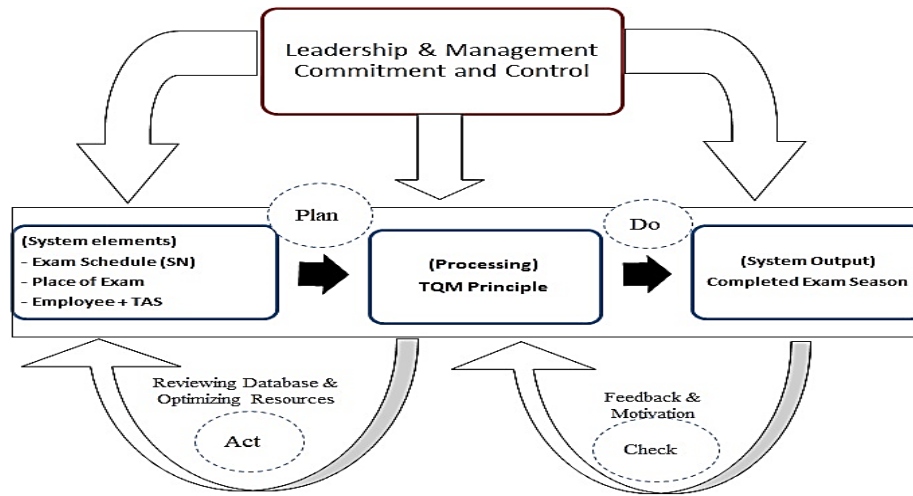


Fig. 2. The proposed framework of the observation process model using PDCA technique.

Customers’ needs were the objective which leads the continuous improvement process, evaluation of the system inputs was the first step of the first cycle (Plan). Many of the restrictions were applied to most of the team; especially men who are the supervisor of monitoring the exam process. Especially on long days; which started at 9 AM and end at 4 PM. It becomes more complicated if the supervisor is not satisfied or is not able to work long periods, especially if there is a sense of poor planning by managers.

Table1(a) describes the usage case of the institution buildings; B1, B2, B5; during the exam period. Table 1(b) describes timetable of exam for each level; Prep., L1, L4; per week. As shown in Table 1(a) *more time consumed despite that there are unused buildings as shown in table 1(b). ** this might cause an overload of work on a lot of workers, and a load applied on the students of the evening exam levels; especially, in Ramadan Fasting dates.

Monitoring the work and justice between the team had a direct impact on saving a lot of money. this money has been given to the unworthy, and inefficient people in the past. Still, there are some deficiencies in justice among members. The path to justice comes through the effective management of enterprise resources to achieve job satisfaction and customer satisfaction and to activate accountability mechanisms.

Table 1(a)
Timetable for the 1st PDCA Cycle

Levels	Day1	Day2	Start Time	End Time
Prep.	Sat.	Thu.	9 AM	12 PM
L1	Sun.	Wed.	9 AM	12 PM
L2	Mon.	Tue.	9 AM	12 PM
*L3	Sat.	Thu.	1 PM	4 PM
*L4	Mon.	Tue.	1 PM	4 PM

The second step (Do) of the first cycle was to impose instructions and rules to manage the process and to emphasize the

mechanisms of reward and punishment that were not in place before, this step has its effect on the reward value for each worker with 40%.

Table 1(b)
Building Occupancy in the 1st PDCA Cycle

Levels	Institution Building Usage (IBU)				
	B1	B2	B3	B4	B5
Prep.	Most	Part	-	-	-
L1	Most	Part	Most	-	-
L2	Part	Part	Most	-	-
L3	Part	Part	Most	-	-
L4	Part	Part	Most	-	-

The third step (Check) was, asking customers; feedback process. The fourth step (Act) is the preparing step before starting the second cycle of PDCA technique.

Table 2(a)
Timetable for the 2nd PDCA Cycle

Levels	Day1	Day2	Start Time	End Time
Prep.	Sat.	Thu.	9 AM	12 PM
L1	Sun.	Wed.	9 AM	12 PM
L2/L3	Mon.	Tue.	9 AM	12 PM
L4	Mon.	Tue.	1 PM	4 PM

The second cycle (second semester) planned according to the fourth step of the first cycle, it was a continuity of developing services based on the customers’ need. Table 2(a, b) illustrate the changes occurred in this cycle. Time saved with 16.7%, reward value increase with 50%. Job satisfaction level was increased, which relatively impact on customer satisfaction. Like; students of L3 who switched from the evening exam to the morning, consequently; appositive impact on the team responsible for controlling and managing the L3 exam.

Table 2(b)
Building Occupancy in the 2nd PDCA Cycle

Levels	Institution Building Usage (IBU)				
	B1	B2	B3	B4	B5
Prep.	Most	Part	-	-	-
L1	Most	Part	Most	-	-
L2/L3	All	All	Most	Most	-
L4	Part	Part	Most	-	-

The third cycle (third semester) was an extension to the previous one; more saved time with 33.3% and increased reward with 60%; high-level satisfaction for all members of the process. Table 3(a, b) show the results of resources management and integration between the institution's elements. Where the exam start time shifted to 10 AM, and all buildings are used mostly.

Table 3(a)
Timetable for the 3rd PDCA Cycle

Levels	Day1	Day2	Start Time	End Time
L1	Sat.	Thu.	10 AM	1 PM
Prep./L3	Sun.	Wed.	10 AM	1 PM
L2/L4	Mon.	Tue.	10 AM	1 PM

Table 3(b)
Building Occupancy in the 3rd PDCA Cycle

Levels	Institution Building Usage (IBU)				
	B1	B2	B3	B4	B5
L1	Most	Part	Most	-	-
Prep./L3	Most	All	Most	Most	Most
L2/L4	Most	All	Most	Most	Most

Despite the resistance to change and the lack of commitment of management, there has been a partial gradual change in the culture and work environment, in terms of emphasizing the principle of customer satisfaction, feedback, teamwork, effective management of enterprise resources and human resources, understanding and flexible interpretation of regulations and high effect of using information and communication technology on the services performance.

During the research process, many obstacles faced, which approved the finding of Salameh et al. [6] that, the competent administrative leadership is the backbone for implementing TQM methodology. In the same context, Juneja et al. [12] assured on the dominance of service quality and adaptability of TQM in the service sector. They concluded that, if the organization has significant problems such as a very unstable funding base, weak administrative systems, lack of managerial skill, or poor employee morale, TQM would not be appropriate.

Lack of ICT clearly visible and has a serious effect on the institution services performance. This approved the finding of the previous studies. They concluded that the internal organizational communication has its influence organizations' performance and productivity, it plays a real role in employee

motivations and development and has a great influence in achieving the goals and objectives in the short term [13] [14] [15].

Table 4 summarize the changes occurred during the adoption of PDCA cycles in three semesters. Where X represents the morning exam, and Y represents the evening exam. A gradual decrease of members loads which appears in the the decrease of the number of (Y) till reach to eliminate (Y) in the 3rd cycle. Finally the procedure unified the loads for all members; Teaching Assistant Staff TAS or Employees. this procedure left a direct and tangible effect for the process which is, a 33.3% saved time for TAS, and a 60% increase in the reward for an employee.

Table 4
Workloads as a Result of PDCA Adoption

Observer Category	PDCA Cycles		
	1 st	2 nd	3 rd
TAS (Men)	2X+4Y	3x+2y	4x
TAS (Women)	4X+2Y	4x	4x
Employee (men)	4X+2Y	3x+2y	4x
Employee (Women)	4X	4x	4x
preparation Team	6X+4Y	6X+2Y	6X

4 RESULT AND ANALYSIS

During this study, a sub-process of administrative processes was developed at the Faculty of Engineering at Helwan University FEHU, which was studied as a sample of a public (public) and non-profit service provider in Egypt..

The reorganization and management of resources and the integration of elements of the system have led to the full and equitable use of all elements involved. Therefore, saving time and money; compared to the past; is an important indicator and a direct result of research. it can be summarized in; justice in the distribution of burdens on all participants which led to saving 15.6% in 2nd cycle, reached to 33.3% in 3rd cycle of wasted time and increasing participants' reward to 40%, 50%, 60% during the adoption of three cycles, respectively. The customers' needs were the key or the operator of the work; customer focuses as one of TQM principles which is the main objective to any successful services providers. PDCA technique used in managing the process and resources and concentrate on the quality of the service by assuring the continuous improvement, to achieve the aim of the work which is Internal customer satisfaction and external customer satisfaction. The full use of manpower and resources were the most important reasons that compelled everyone to abide and stop exceptions and compliments and had an impact on the high level of satisfaction.

5 CONCLUSIONS

The integration between the system elements as a goal itself, it may be a road to IC and EC satisfaction. The integration of institution elements is the main role of the management system who is the maestro of the system. This integration cannot be done efficiently without the activation of ICT and building a

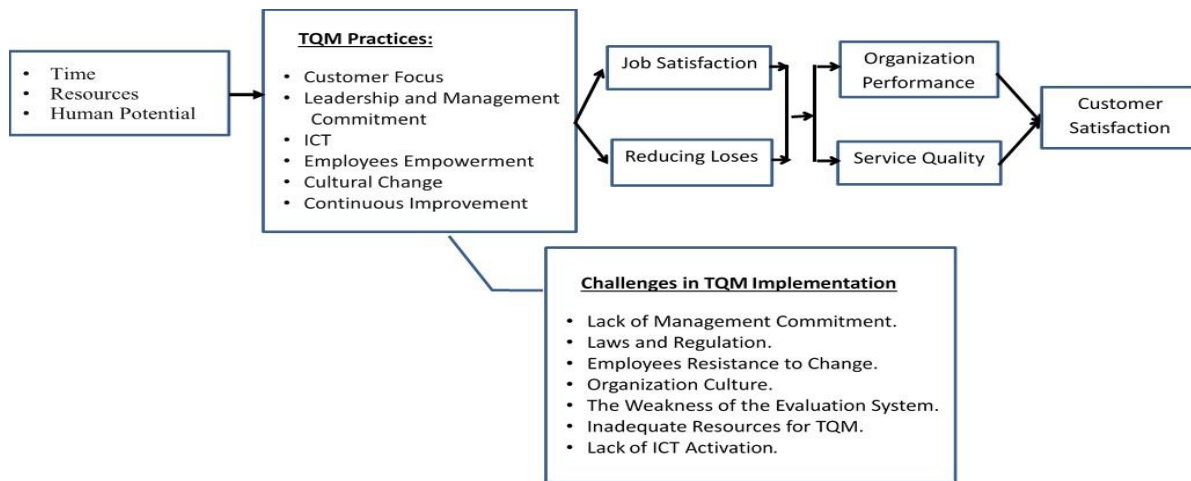


Fig. 3. Research framework

robust network with trained workers. the employees' evaluation mechanism must be modified completely to reduce the waste of state resources occurred in the civil services institution. The Egyptian governmental services institution needs more efforts to successfully implement TQM correctly.

The research framework described in fig. 3., illustrates the procedure and stages between determining the system input until producing the system output. Implementation of TQM principles are the intermediate stage which ensures the job satisfaction and reducing wastes to get high-level of organization performance and services quality and consequently reach to customer satisfaction, there are several obstacles facing the implementation process. The maestro of this process who can manage and integrate all elements and resources, and skip the obstacles is the committed leadership and management system.

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