

Impact of Digital Monitoring on Organizational Performance in Egyptian Governmental Sector

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Abstract:

This study aims to determine the effect of using information technology and increasing organizational learning on the performance of employees as well as the overall performance of the organization. The research included the implementation of an information system that targeted to monitor and evaluate the organization and employees' performance before and after using the system. It also aimed to measure the change in performance and the increase of organizational learning through training programs and the encouragement of innovation to enhance the performance. In order to fulfill the purpose of the study, the required information was obtained from the Egyptian International Trade Point Sector (EITP), Ministry of Trade and Industry. The study reached some results; most significant is the increase of performance. This increase was clear in many of performance evaluation indicators (KPIs). Trade opportunities distributed increased by 22.7%, the beneficiaries of distributed opportunities increased by 104.9%, promotion operations of companies' products increased by 88.3%, but the promotion replies decreased by 19.44%. This is due to the deficit in the international demand worldwide.

Keywords: "Electronic Monitoring, Evaluation Performance, information systems, organizational learning, training".

1. Introduction

As a result of the shortage in information technology for SMEs in developing countries, The United Nations Conference for Trade and Development (UNCTAD) recommended the idea of launching the Trade Point Program in 1992 [1]. Egyptian International Trade Point has begun by recommendation of World Trade Point Federation (WTPF) under the authority of Ministry of Trade and Industry and it started to provide promotion services since 1994. Egyptian International Trade Point Sector EITP is located in Egypt in 15 governorates representing 17 branches working under authority of headquarter in Cairo [2]. EITP is considered a promotion center, which promotes for Egyptian products through B2B web site and participates in local and international exhibitions to promote for Egyptian companies (products and services), it provides trade opportunities through electronic system to Egyptian companies, it also facilitates trade operation by providing data concerning laws, rules and regulations and also custom tariffs [3]. In particular, it is well known that the goal of any top management is to achieve high performance through obtaining accurate reports and in the same time fulfilling the preset business plan, but this is very hard to be implemented. EITP has an annual business plan, which divided into 4 quarters. According to the manual system, the reports are not accurate and the employees have low productivity in sub trade points.

To develop the performance of the employees in the Egyptian trade points and hence develop the overall organization performance, we have to solve these problems by asking how to obtain accurate reports and how to enhance the performance and the discipline of employees?

1.1 Defining the Problem Statement

We had discussions with some of sub trade points staff (supervisors and employees), and we understood that the reason behind these problems is the shortage of internal control system [there is no Electronic Monitoring and Evaluation System resulted the difficulty in tracking performance.

The other reason is the missing of a professional way in customer services and couldn't find the best way for satisfying the customers as a result of insufficient training.

Finally, after discussions this information helps to decrease the gap, narrow the broad problem area, and define the problem statement: "How can we use the information systems through design Electronic Monitoring and Evaluation System to achieve the internal control? How can this system help to enhance the employees' performance and provide accurate reports for evaluation? How providing the training programs to employees can help to enhance their performance and hence the overall organization performance?"

1.2 Research objective

This research aims to study the influencing factors on the employees performance, and hence the overall organization performance. Mainly focuses on the impact of using Information System (Electronic Monitoring and Evaluation System), which enhances the communication between the top management and employees (the internal control) and increase employees' performance, in addition to the impact of the Organizational Learning on increasing the organization performance. With taking into consideration, the effect of the innovation and the training programs, on the relation between the information systems, the organizational learning, and the employees performance as well.

1.3 The Research Project Structure

This project includes five Sections. Section one is the introduction which presents the scope of the study, explaining the services provided by EITP to increase the Egyptian exports and defining the problem statement which is how to increase performance using information technology and finally the research objective.

Section two provides the background theory and it gives the literature review, which includes previous studies concerning information technology, performance appraisal, resistance to innovation, the conceptual model that will be used in this study. Also it gives the view of theoretical Framework and research design though discussing and testing the relationship between the project model variables which includes the dependent (performance), independent variables (information technology, Organizational learning) and training, innovation as moderating variables.

Section three includes research methodology and the proposed information system (Electronic Monitoring and Evaluation System analysis).

Section four provides the data analysis, finding and discussion. In this section we present details, findings and comparing data before and after the implementation of the new system. By observation and analysis for available data, we reached to the findings which proved the positive relation between using information systems and the employees' performance.

Finally section five includes the conclusion, recommendations and future work which summarized the final results and confirms that the researcher achieving the research objectives.

2. Previous Studies

2.1. Overview

According to previous studies, human resources management is a crucial factor in the assessment of organizational success. Top management is always seeking to create a balance between corporate goals, employees' demands and needs as well as societal responsibilities [4]. Top management also works to motivate employees and enhance their contribution as well as increase their knowledge, skills and abilities [5].

One of the top management tools to enhance employees' performance is follow up and evaluation the performance through using information system. In this study, the following literature review will help to understand the background of the phenomenon.

2.2 Performance Appraisal

According to JAING [5], an employee's performance is a function of three variables: ability, opportunity to perform, and motivation. In order to maximize employee's performance, his skills need to be enhanced, he should be given an opportunity to contribute and he should be motivated. Top management has to assess staff's and organizational performance from time to time on regular basis, so that to be able to identify any deviation in performance, and thus information systems are needed.

Continuing with other review [6] said that a performance appraisal is defined as a systematic evaluation of the performance of employees as well as how to assign duties and responsibilities and understand the abilities of the employees. The appraisal should base on what the employee actually achieve not on the employee's personality characteristics.

2.3 Information Systems

An information System is some integrated activities that consist of procedures and methods, technology and people, which interact with each other to provide stored valuable data and information. The system provides all the required data and information through data processing, when the end user requests specific information, the system must interact with him to provide the required information accurately [7]. According to this study, the best information system is that one which deals with all level of management and can interact with the end user in terms of providing required data, information and the flexibility to obtain accurate reports for all levels of management.

2.4 Monitoring Employees

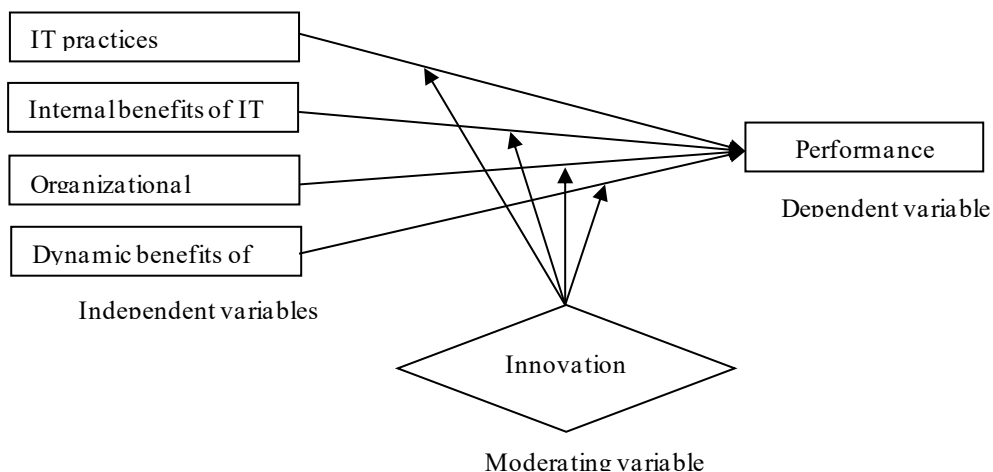
As cited in [8] monitoring may affect employees in two broad directions. First, surveillance techniques may affect employees' feelings about work and the workplace emotions, attitudes, beliefs, etc. Second, monitoring may modify employee behavior including productive, citizenship, and unproductive behavior. It is well known that, when the administration uses a variety of means to monitor the performance of employees it can result in low productivity growth, because using such as means effect employees emotions and attitudes, therefore the top management must work to change the culture of staff before implementing the monitoring and surveillance system.

2.5 Resistance to Innovation and Change

Innovation is an important factor to efficiently implement internal control system. In the current study, that means using new software and hardware to monitor the employees' performance. The expression innovation normally sounds like something great and fabulous. Many people are a afraid from this term; this is because most of people are resistant to change. To innovate is to discover something totally new, change internal and external work environment, it is something totally different, an unstoppable solution to a number of problems [9]. By reviewing previous studies, we found that they argued the impact of information technology on organizational performance but they didn't discuss the effect of implementing it in governmental sectors. I think it is important to clarify that implementing the electronic monitor and evaluation system in governmental sectors is considered the basic for good governance and it enhances changes in the work environment. It enables top management to follow and assess employees' performance by monitoring all activities performed by employees.

2.6 Conceptual Model

In considerable studies, the impact of IT on performance is investigated as a whole. Butin particular, the study by [10] examined the effects of relationship between information technology and firm innovation on firm performance (case of Albania), the study divides (Information Technology) to three parts (IT practices, internal benefits of IT, dynamic benefits of IT), and makes multiple regression analyses. According to data collected, the analysis shows that dynamic benefits of IT, IT practices, internal benefits of IT and organizational learning, have significant effects on firm performance but the firm innovation has a moderating effect between IT practices, internal benefits of IT, organizational learning, dynamic benefits of IT and firm performance.



2.7 Theoretical Framework

Figure 1:conceptualmodel

In the current study, we are trying to examine the relationship between information technology, organizational learning as independent variables and performance as dependent variable. Training and innovation as moderating variables. The study will use the model of [10] from previous literature review. But we will use information technology without dividing it to sub variables and add training as moderating variable. According to this aim, will develop a research model, and we will make analysis according to a available methods for collecting data.

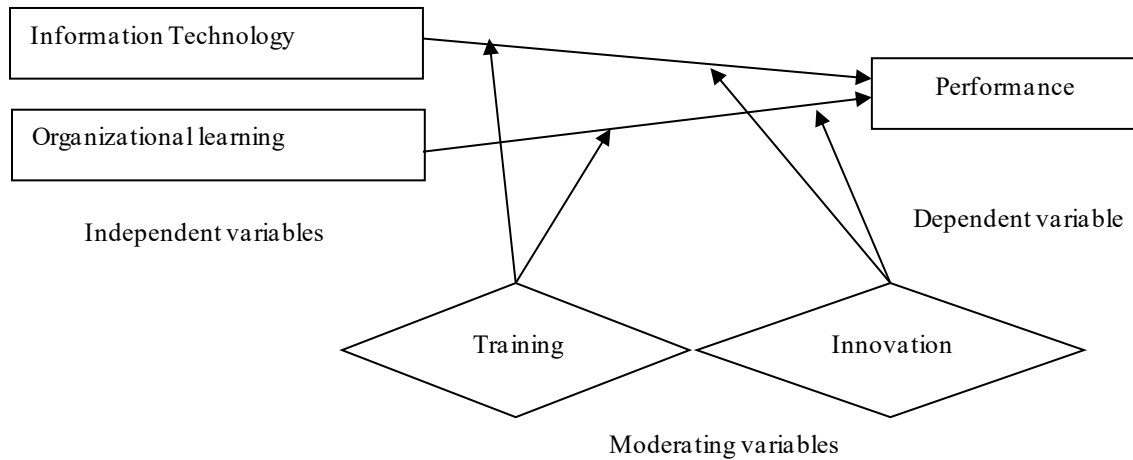


Figure 2: Proposed conceptual model

2.7.1 The Dependent Variable:

Performance: Definition and Importance

Performance is the achievement of a given task; it takes consideration to the fulfillment of a commitment written in a contract. Performance is measured according to the standards of accuracy, completeness, cost, and speed mentioned in the contract and according to labor market. In business, performance is to measure productivity and there are two main criteria to measure the performance, objectivity and clearness [10]. Using electronic monitoring and evaluation system to measure the performance is the successful method to know that specific jobs or tasks have been performed well and how the workers' performance contributes to the achievement of company objective [11]. Some other definitions of performance are cited in [12] Performance is what the organization hires one to do, and do well [13]. Thus, performance is not defined by the action itself but by judgmental and evaluative processes. Moreover, only actions which can be scaled, i.e., measured, are considered to constitute performance [13]."

2.7.2 The Independent Variables

2.7.2.1 Information Technology

Information Technology (IT) refers to anything related to computing technology, such as infrastructure, hardware, software, telecommunication networking, the internet, wireless technology, database or the people who work with these technologies. Most companies today are managing their businesses using information technology. Since we live in the technology age, information technology has become a part of our lives [14]. Information Technology (IT) enhances the ability of enterprises to survive in the highly competitive global marketplace. Information technology (IT) helps the managers to formulate and implement business strategies. Therefore, the information systems become the main tools for doing business, most business strategies cannot be carried out without using of these tools [15]. The current study depends on using information systems to monitor the employees' performance through using electronic monitoring and evaluation system. There are many benefits of using IT, It helps the manager and employees to improve the efficiency and effectiveness of their business processes, build team work in business environment and enhance managerial decision making as well as reducing operation costs.

2.7.2.2 Organizational Learning

Organizational learning is transferring knowledge from generation to generation within the organization. This leads to improve the gained experiences over time inside the organization and it increases production efficiency and develop beneficial investor relations. Knowledge can transfer among four different levels: individual, group, organizational, and inter-organizational. Organizational learning concepts became very important trend for organizations and companies. On the organization level, the learning applications consist of individual learning, training, and development. The process of individual learning has a significant impact on the concept and practices of organizational learning [16].

Organizational learning leads to greater innovation capability in both products and processes. Furthermore, innovation capability is positively related to firm performance [17]. According to previous perspectives and comparing the organizational learning in private sector and government sector; the organizational learning in private sector is better than government organizations, since private sector has higher capability and more innovation while government sector lacks to these factors, also government employees don't transfer knowledge among them, because there is a fear from losing the authority if they transfer the experiences and learning.

The Moderating Variables

2.7.3 Moderating variables:

2.7.3.1 Innovation

Innovation is defined simply as something new, a new idea or invention which helps to produce new device, providing new service or enhance the current, it can be also a new application or better solutions that satisfies the society needs or market needs. Such as products, services, processes, business models or information technology. Teresa Amabile provided the triangle of creativity. As well-known, creativity needs knowledge which means understanding, information, or skill that anyone gets from experience or education. The second component is creative thinking. It refers to how people examine the problems, provide the solutions; the skill depends on personality as well as on how a person thinks and works. The third component is motivation, there are two types of motivation, internal or external, and the internal arises from the people themselves. They can find their work interesting or exciting, or they fear failure in their jobs. The external motivation comes from business environment, such as rewarding system, motivating people to find a solution for a specific problem, promotion for higher position [18].

2.7.3.2 Training

As cited in [19] Training is “a planned process to modify attitude, knowledge, skill or behavior through a learning experience to achieve effective performance in any activity or range of activities. Its purpose, in the work situation, is to develop the abilities of the individual and to satisfy current and future manpower needs of the organization (Manpower Services Commission (MSC), U.K., 1981: 62)”. Training has specific goals of improving employees' capability, productivity, performance and improves the organizational learning and knowledge. The managers play a critical role in transferring the experiences and providing opportunities to employees for learning [20]. One of the most important programs that is organized by The Ministry of Planning, Monitoring and Administrative reform in Egypt is granting governmental MBA program in cooperation with ESLSCA Business School.

2.8 Research limitations

Limitation 1: Research is limited to employees who are working at Egyptian International Trade point, Ministry of Trade and Industry in Egypt.

Limitation 2: Research is limited to obtain data from software application “Electronic Monitoring and Evaluation System” in Egyptian International Trade Point.

2.9 Research questions

MjRQ 1: How can we use the information systems through design Electronic Monitoring and Evaluation System to fulfill the internal control?

MjRQ 2: How do the Organizational learning affect the employees experience and hence their performance?

2.9.2 Minor Questions

MinRQ 1: How can the training programs help to enhance the employees' performance?

MinRQ 2: What is the effect of updating the infrastructure on improving the employees' performance and hence the overall organization performance?

MinRQ 3: To what extent is the importance of the accuracy degree of the new system reports in evaluating the employees' performance and hence the overall organization performance?

2.10 Hypotheses

Here the researcher has developed some alternative hypothesis statements depending on the theoretical framework

H1a: The implementation of the information systems has a positive effect on the employees' performance and hence the overall organization performance.

H2a: The organizational learning has a positive effect on the employees' experience hence their performance.

H3a: The training programs have a positive effect on the relation between the information systems, the organizational learning, and the employees' performance.

H4a: The innovation has a positive effect on the relation between the information systems, the organizational learning, and the employees' performance.

To test these hypotheses there is a need to develop and build new information system for electronic monitoring and evaluation and the implementation of it in the government sector (Egyptian International Trade Point) then comparing the performance before and after the implementation of the new system. Also providing training course to employees to train them on how to use the new system, update hardware (computers, router) and increase internet speed for branches and headquarter.

3. Research Design

3.1 Research Methodology

3.1.1 Research Type

The purpose of this research is to study the influencing factors that impact the employees' performance hence the overall organization performance. The logic of this research is "deductive" as the proposed system was built using established theories.

The type of investigation is "a correlation study" to identify the effect of the main influencing factors (Information system, and Organizational learning), with taking into consideration, the other influencing factors (training programs, and Innovation) on the employees' performance.

The study setting is "a contrived field study", the research is conducted where the flow of activities takes place in their natural system as normal, but with a moderate researcher interference.

The extent of researcher interference is "Moderate", because there is a medium researcher interference with the natural flow of events. (The researcher designed and controlled the proposed system that will be tested in EITP and its branches. The performance will be measured before and after the implementation of the system).

The unit of analysis is "employees of branches and headquarter" as the focus is measuring each employee performance.

The time horizon is "Longitudinal study", because this research study involves repeated observations of the same variables over long periods of time, to make observing changes more accurate. (Before and after the implementation of the proposed system).

3.1.2 Data collection

The researcher depends on observation in collecting data, through comparing the manual reports before the implementation of the proposed system, with the electronic reports of the new system.

In addition to depending on some unstructured interviews with some employees, after providing training courses and some effort from top management to increase organization innovation.

The Electronic Monitoring and Evaluation System will monitor and evaluate the employees' performance in headquarter and sub trade points. This system will measure employees' performance through (KPIs). And the scope of the system is EITP (headquarter and 17 sub trade points)

3.2 Electronic Monitoring and Evaluation System analysis:

3.2.1 System Description

Electronic Monitoring and Evaluation System will monitor and evaluate the employees' performance. This system will have linkage to online organization website to measure employees' performance through (KPIs) such as promotion numbers for companies and responses from foreign companies and also measure how the Egyptian customers will interact with the website. Top management can obtain electronic reports for all employees' performance in headquarter and sub trade points at any time for any duration.

3.2.2 System Scope

EITP (headquarter and 17 sub trade points)

3.2.3 System Users (Customers)

The proposed system has three users' levels: the top level, for the administrator who can manage all privileges, it will be for top management. Middle level to the all employees of EITP and its branches and managers in middle management. The third level will be to the clients, Egyptian exporters, and foreign importers.

3.3 SWOT Analysis

The following table represents the strengths, weaknesses, opportunities, and threats analysis of EITP to apply the new system.

Table 1: SWOT Analysis

Strengths	Weaknesses
<ul style="list-style-type: none"> - Infrastructure availability. - High internet speed. - Enthusiastic team work. - Databases updated permanently at headquarter for (Egyptian companies). - Availability to use Mobile application. 	<ul style="list-style-type: none"> - No budget for (system developing, firewall, server, training) - Some sub-trade points have old computers. - Database in sub trade points not updated. - Shortage in employees so we need more employees to work in headquarter and sub - trade points
Opportunities	Threats
<ul style="list-style-type: none"> - Modern technological revolution and the rapid development. - Unique relation with other ministries especially Ministry of Communications and Information Technology - Providing free marketing services to Egyptian companies in different governorate through the branches. - The existence of communications network with the business community and the various national & international organizations & institutions 	<ul style="list-style-type: none"> - Difficult to obtain funding according to government procedures especially with current economic circumstances - Security concerns (hacking, data lost...) - Resistance to change from the employees in branches.

4. Data Analysis, Finding and Discussion

Through this study, we have obtained data from the manual reports before the implementation of the Electronic Monitoring and Evaluation System as well as electronic reports from the new system.

By observation and comparing the performance before and after the implementation of the system, and also by unstructured interviews with some employees after providing training courses and some effort from top management to increase firm innovation, we noticed some findings which prove the current model of study.

4.1 Opportunities Data

By comparing manual reports before the implementation of the information system to automatic reports after the implementation of the information system, we can observe from the figure (3) the following results:

- The implementation of the Electronic Monitoring and Evaluation System enhanced the employee's performance; the distributed opportunities increased by 22.7% also the total number of beneficiaries increased by 104.9%.
- Automatic reports have high degree of credibility as opposite to manual reports so the opportunities from manual report might not be a right number and could be less than this, so using Information system encourages the employees to enhance the performance especially when relating it to the incentives system in EITP so it increased by 400 opportunities.
- Using this information system enabled the employees to distribute opportunities on larger number of beneficiaries than the manual reports.

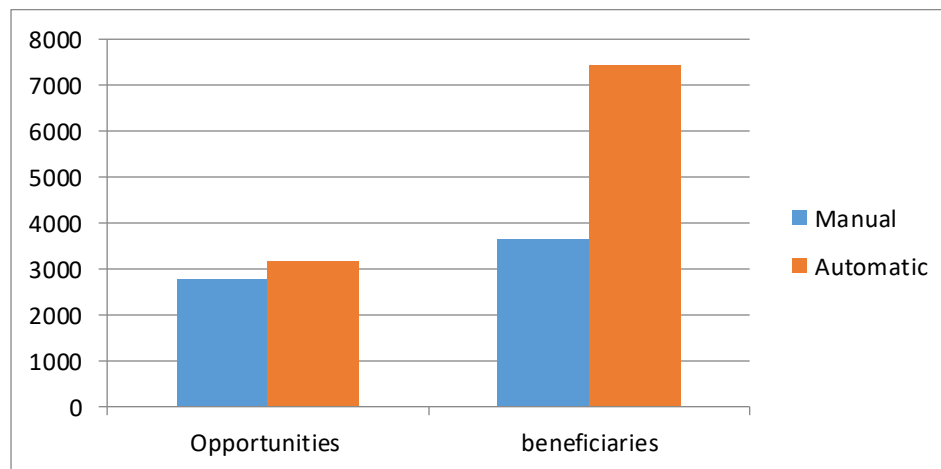


Figure 3: Trade Opportunities and beneficiaries

4.2 Promotion

From figure (4), we can note that before the implementation of the Electronic Monitoring and Evaluation System, the executive office of head of EITP didn't get number of companies and number of commodities but they can get only number of promotion. After the implementation of the new system it provides total number of promotion, total number of companies served by Egyptian International Trade Point, total number of commodities for each branch also it provides the number of web sites which the employees used for promotion.

Before the implementation of the new system the employees used to promote by using one or two websites and most of them didn't use the Egyptian International Point web site. After the implementation of the new system they were forced to use the main web site to promote for companies because it is linked to the new system then they promote using at least other five web sites and in some branches it arrived to ten web sites. So promotion increased by 88.3%

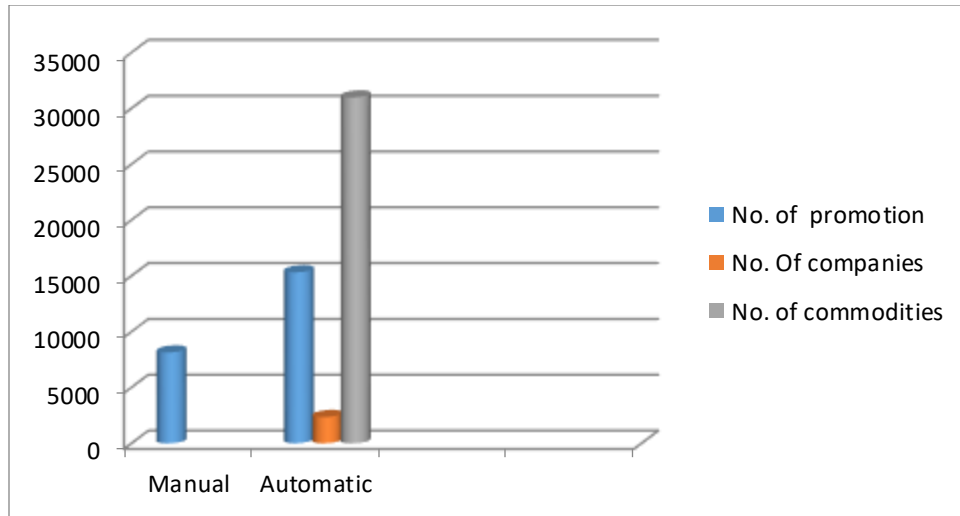


Figure 4: Promotion

4.3 Replies from Foreign Companies

According to increase in promotion for commodities and companies using various web sites, the requests from foreign companies was supposed to be increased but it didn't. As appeared in figure (5). It doesn't mean the performance decreased for the employees but there are many reasons for that.

The reason of reduction in replies from foreign companies recently to the following:

- Decline in global demand for goods and services in the world.
- Reports before the system were prepared manually therefore the number of replies which were sent by the branches may not be accurate but after the implementation of the new system it counts them automatically.

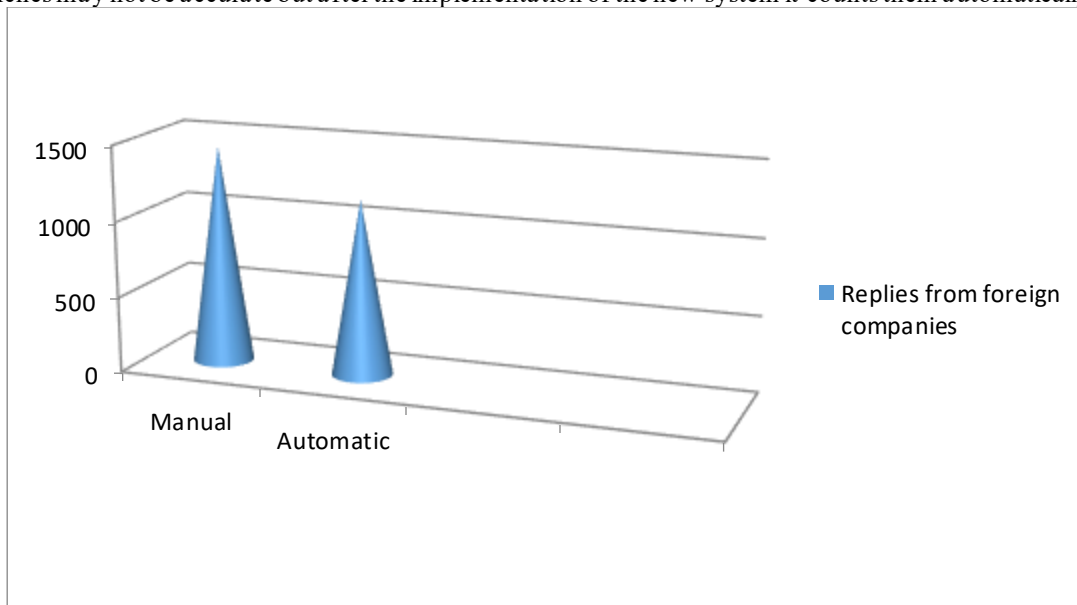


Figure 5: Replies from foreign companies

4.4 Other Inquiries:

Before the implementation of the Electronic Monitoring and Evaluation System, the organization didn't have any tool to know how many other inquiries came from the companies to the branches.

After the implementation of the system the organization has a report with full details, It provides all types of inquiries and the action to answer the inquiries through the branch and headquarter. It also identifies the employee who answers the inquiry. Therefore, there is a possibility to follow up the inquiries and measure the performance

of employees. Most of the inquiries were answered by headquarter because it has the biggest number of Egyptian companies in the database, figure (6) display the inquiries numbers among headquarter and the branches.

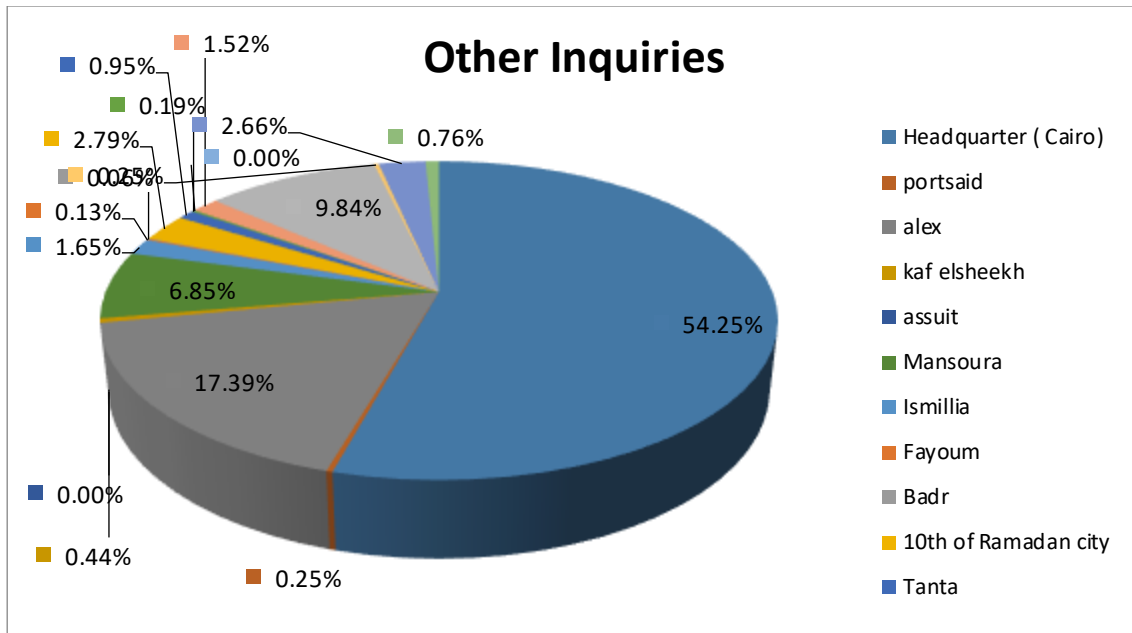


Figure 6: Other Inquiries

4.5 Organization Learning, Training and Innovation

After the implementation of the information system, there was a need to train employees to use the new system. Top management arranged many training courses for the employees especially who work in sub trade points. By observing the performance, it increased gradually. By asking some employees about training effect on increasing performance, they agreed that training helps to increase knowledge and by increasing organization learning, it leads to increase in their performance. Therefore, training has a moderating effect on the relation between organization learning and the performance. Also it has the same effect on the relation between information technology and performance because without training they cannot use the new system.

Innovation also plays a moderating role, it affects the relation between information technology and performance. On the other side, innovation increases organization learning, according to the study the first step that the organization takes to increase the performance is using information system which means the implementation of new idea in the organization environment and it will help the organization to enhance the provided services.

5. Conclusion

The main objective of this study is to assess the impact of using Information systems (Electronic Monitoring and Evaluation System) on employees' performance to enhance organization performance. Especially in the government organizations, therefore we choose one of these organizations, which work in the field of e commerce; the organization is Egyptian International Trade Point (EITP) one of Ministry of Trade and Industry sectors.

The study explains the activities of EITP, which represent an international promotion center, then, it offered some literature reviews concerning the performance appraisal, information systems, monitoring employees, resistance to innovation and change. In addition, reviewing some definitions such as information technology, organization learning as independent variables. The performance as dependent variable, also reviewing the definitions of moderating variables; training and innovation.

The study includes also some hypothesis concerning using information systems and employees' performance, the role of training, the organization learning and performance.

Data analysis proved that using Electronic Monitoring and Evaluation System helps to improve the employees' performance. By comparing data before and after implementing the Electronic Monitoring and Evaluation

System, the findings confirm that there is a positive relationship between using Electronic Monitoring and Evaluation System and employee's performance. After the implementation of the new system, the performance of employees increased, the distributed opportunities increased by 22.7%; number of beneficiaries increased by 104.9%; no. of promotions increased by 88.3%. The comparison was between a period of ten months only before and after the implementation of the system because available data before the implementation of the system was for ten months only, therefore we compare it with a period of ten months after the implementation of the system.

The system also helps top management to obtain regular reports and constructive feedback from the employees and the customers. Regular meetings between managers and employees facilitate and solve organization's problems and help to achieve short and long term organizational objectives.

This type of monitoring enhances the quality of work and increases the employee's performance. Therefore, it encourages them to be interested to achieve the organizational goals. In addition, linking employees' performance to incentives according to the information system reports, which were introduced to top management and managers helps in increasing employees' performance. Regular reports, which were introduced to managers and the employees help in enhancing the performance and assist the employees to make a self-evaluation. By using the system and activating constructive feedback from the employees helps to solve the problems even before they begin. All of these factors increase managers and employees satisfaction and encourage them to achieve the organizational goals and plans.

6. Recommendations

Some recommendations can help in developing the current system. The first one is considering the current system; it does not include an automatic planning section, so in future, the developers of EITP can develop automatic planning and make automatic comparison between the plans and the achievements.

The second one is after making some development to the system; it can be applied on a wider hierarchy scale it can be used for the whole ministry sectors not only for one sector, it can link all ministry sectors with minister's office to follow up and evaluate the performance in whole ministry's sectors.

The third recommendation is that Electronic Monitor and Evaluation System can be applied among the ministries' offices and the cabinet.

The fourth one is that to enhance and arrive to high quality of performance, the head of EITP can monitor all sub trade point by using surveillance cameras.

7. Future Work

Future work implies that the parliament issues rules and regulations for the ministries and its affiliates sectors to obligate their using electronic system for monitoring and evaluation. Also there can be a need to develop a new version of the Electronic Monitoring and Evaluation System to meet the new requirements to be applied for the ministries and the cabinet. In parallel, it will be useful to create a central monitoring and evaluation unit in each ministry to supervise the application of the electronic system as mentioned in this study. In addition to this, installing surveillance cameras system in each branch following Egyptian International Trade Point and also installing surveillance cameras system in the different government organization in Egypt.

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