

## Obstacles and Barriers Facing Adopting Electronic Inventory Control Systems in Four-star Hotels in Cairo

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### Abstract

This paper aims to determine the obstacles and challenges facing adopting electronic inventory control systems in four-star hotels in Cairo. This study is based on a quantitative research approach. In order to achieve the objectives of the study, the 150 questionnaire forms were distributed to stores department staff (stores manager, assistant stores manager, store keeper, assistant store keeper, and inventory controller) in 30 four-star hotels located in Greater Cairo. The number of valid questionnaires for analysis is 136 with a response rate (90.6%). The data analysis was conducted through the statistical package of social sciences SPSS (version 26.00). The current study found that there are some obstacles that prevent and reduce the optimal level of adopting the electronic inventory control systems in stores departments in four-star hotels in Cairo, despite the importance of such electronic systems in inventory monitoring.

The obstacles facing stores departments included technical, organizational, financial, and security obstacles. This is confirmed by the study urging more considerable attention to this aspect and by trying to overcome these obstacles.

**Keywords:** Obstacles, Barriers, Electronic Inventory Control Systems, Four-Star Hotels, Cairo.

### Introduction

An electronic inventory control system can be defined as a system that enables the stores management to automate, manage, and monitor stores management's processes accurately and speedily. So, precise control and safeguard of the inventory is an essential task for a successful and well-organized hotel (Sande, 2003).

Vanik, (2004) reported that electronic inventory control systems are integrated software and hardware systems used in stores management's operations to monitor the quantity, location and status of inventory as well as the related shipping and receiving processes.

Despite the rapid evolution of inventory control technologies and its applications, limited studies have investigated obstacles and barriers facing adopting electronic inventory control systems in hotels. As there are some internal and external challenges and obstacles that prevent the full and the optimal adoption of these systems which as a result might reduce the benefits gained from applying such systems in the case of adopting these electronic systems besides the manual ones, despite the actual existence and availability of these electronic systems (Sahadev and Islam, (2005).

Auramo et. al., (2005) The main challenge within the selected hotels is the use of manual inventory control systems based on paper-worked systems which are considered outdated control systems that lead to low inventory turnover, shoplifting, inaccurate information about out-of-stock items as well as overstocked items in stores management and inability to respond to the market. Accordingly, the study problem can be formulated as follows: the limited adoption of electronic inventory control systems and their modern applications in the stores management within the targeted hotels.

Therefore, this paper aims to identify the obstacles and challenges facing adopting electronic inventory control systems in four-star hotels in Cairo.

## **Literature Review**

### ***Adopting electronic technology in inventory control***

As a result of the previous century electronic technology revolution which has become vital and integral part of every business plan, hospitality industry tried to keep up with the times and turned towards adopting electronic technology and information technology depending on computer with its components hardware (includes all physical equipment that enables computers to function as the central processing unit CPU, disk drives, keyboards, printers or screens) and the generic software (the instruction for hardware that is on the computer directed to develop and use an information system), such as word processing, spread sheet, specially written records management applications, and the world wide web (LAN and WAN) which can use a wide range of peripheral devices such as scanners, bar code readers, printers and among others to improve their work efficiency and information flow (Davila et al., 2003).

Database applications also are considered one of the smartest modern technologies that allow to facilitate work and organize information. The database is a set of logical data elements associated with each other by a mathematical relationship, and the database consists of one or more tables. The table consists of one or more records and the record consists of one or more field. An example is the record of a particular stored product consisting of several fields such as the product serial number, product name, product expiry and production dates, and other product data stored in the computer according to an organized manner, where a computer program called database engine facilitates dealing with such data, enabling the user to search, add and modify these data (Hellerstein and Stonebraker, 2005).

That was evident on latest stores department trends to adopt electronic and a computer-based inventory control systems which are an automated way to ease accessing inventory information, reduce the necessary paperwork in all storage transactions, minimize storage costs, tight control over the stored items, increase the speed on providing stores management with the comprehensive reports of the stored items, estimate storage rates over periods, calculate storage rates (maximum, minimum and demand inventory rates), measure the differences between the expected and the actual usage rates, provide an easy access to storage information whether about the value of items stored or the capital invested in the inventory and facilitate stock-taking processes (Shah and Shin, 2007).

### ***Obstacles Facing Adopting Electronic Inventory Control Systems***

Pizam, (2010) confirmed that due to the huge technological development witnessed by the world in the recent years and its countless benefits, many hotels with its different departments have sought to adopt the technological systems as they have been one of the basic needed requirements to cope with the nature of the current era. As a result, stores departments in hotels tried to abandon the traditional inventory control methods and imply electronic inventory control systems instead in order to make a good use of the various benefits of these modern systems. However, stores departments have faced some challenges and obstacles when adopting such electronic inventory control systems, which are presented in detail below:

#### ***1. Technical Obstacles***

Deraman et al., (2012) stated that electronic inventory control systems have a positive and useful role in improving stores department performance. However, some of these stores departments have not been able to make the maximum use of these modern technological trends because of the existence of some technical obstacles that prevent the implementation of electronic inventory control systems which include:

- Lack of integrated infrastructure for local networks and communications systems at the level of the hotel as a whole, which in turn hinders the implementation of electronic inventory control systems in stores department.
- Difficulty in selecting suitable electronic inventory control systems due to the large variety of different applications, internet access, software, hardware and systems, and the absence of clear bases for selecting among them.
- Incompatibility of computers available in different hotel departments, which is a barrier that prevents stores department from achieving integration between its sections and the other hotel departments on the one hand and it also hinders the development and upgrading of current inventory control technics available in stores department on the other hand.
- Prasanna, (2014) added some technical obstacles that prevent the implementation of electronic inventory control systems including:
  - The radical and rapid development of computer technology including electronic inventory control systems and the inability of stores department to keep up with this development to adopt some recent techniques as using bar code readers and scanners and RFID tags.
  - Some of the electronic inventory control systems, software and applications are complicated for some stores department staff.
  - The lack of some of the necessary features in available electronic inventory control systems, software and applications, which make them negatively, affect the effectiveness of stores department.

Lawrence, (2016) stated that language barrier, especially since most of electronic inventory control systems, software and applications are in English language and which may not be mastered by some stores department employees; and that stores department does not maintain regular maintenance and monitoring of the inventory control systems as some of the companies supplying these systems do not provide technical support, are another two serious problems that can be added to the technical obstacles that prevent the implementation of electronic inventory control systems.

## *2. Organizational and Human Obstacles*

Buxmann et al., (2004) argued that the human element is the most critical element of any modern technical system, without which no technical system can achieve its desired objectives. Equipment, applications and software and other modern technical means are only idle elements without the human element. Stores department in some hotels faces many human problems both at the level of management and at the level of employees, which limit or hinder the application electronic inventory control systems. These constraints are:

- Stores department suffers from some concern and hesitation relating its ability to implement electronic inventory control systems as it has become familiar with its usual manual inventory control systems and routine documentation cycles and refuses to update and change.
- The fear of the idea that switching from traditional to electronic inventory control systems may lead to the reorganization and restructuring of stores department operations and functions which in turns may lead to a reduction in the employees' number.
- Some stores department personnel's fear that the use of electronic inventory control systems could threaten their work because they believe they will replace them one day, forcing them to lose their jobs (Cobanoglu et al., 2006).

- A large number of stores department managers are inclined to rest and do not want to run any new experiments that may exhaust time and effort especially in the early stages of the application of electronic inventory control systems.
- The storage department lacks proper planning to make the transition from manual to electronic inventory control systems goes smoothly.
- The weakness of the material and moral incentive and motivation provided by stores department to its employees to encourage them to adopt electronic inventory control systems.
- Furthermore, Ip et al., (2010) and Aziz et al., (2012) added some Organizational and human obstacles as follows:
  - The modernity of electronic inventory control systems, applications, devices and software which is in contrast to the stores department employees and managers' lack of skill as they suffer from lack of technical training and qualification.
  - Employees and managers' negative trends towards electronic inventory control due to the lack of dissemination of a culture of the importance of keeping up with the development and the necessity to modernize traditional inventory control systems.
  - Failure to provide sufficient time for stores department personnel's training and qualifying regarding relating using electronic inventory control systems. If the training takes place, it will be either at the end of the official working hours or in the workplace, which results in the distraction of the trainees.

### 3. *Financial Barriers*

Burgess, (2000) confirmed that electronic inventory control systems need financial support to provide and cover all of its requirements. However, some stores departments suffer from a lack of financial resources to implement these electronic systems.

Winata and Mia, (2005) illustrated that financial constraints facing stores department include the following:

- The high cost of electronic inventory control systems, including the software, applications and devices, and lack of financial allocations for them.
- High cost of internet and telecommunication services.
- Lack of adequate funding for training and qualifying employees to use electronic inventory control systems.
- High costs of IT experts who have experience in electronic inventory control systems, applications and software.
- Inadequate budgets for the procurement of information protection programs.
- Insufficient financial resources to improve the network and communication infrastructure and to carry out maintenance and periodic updates of inventory control systems.

### 4. *Security Barriers*

Nambisan and Wang, (2000) observed that the rapid technological development and increased communication and information networks that have recently led to numerous security vulnerabilities and growing threats to electronic inventory control systems such as piracy, hacking, espionage and destruction. Examples of these threats are shown below:

1) **Internal hackers:** A stores department employee plays the role of hackers as he violates the confidentiality of available information, electronic inventory control systems and steals, alters, changes, or deletes information on those systems. An internal hacker are considered to be more

serious than external hackers, especially if the attacker has the power to access the inventory control systems and has no difficulty with the safety and confidentiality processes as he can easily erase the effects of an attack.

The employee may do so for one of the following reasons:

1. Cases of dissatisfaction: Security hacking often occurs due to job dissatisfaction, retaliation from a manager or other personal reasons.
2. Proving himself: Employees sometimes have selfish desires to satisfy their ego, in which an individual feels the need to prove his ability to penetrate barriers and violate the privacy of electronic inventory control systems.
3. Financial benefit: The hack may be paid by competitors for the purpose of damaging or stealing information. Thus, some competing hotels may bribe some people to hack electronic inventory control systems for money (Sahadev and Islam, 2005).

II) External hackers: External hacking means that people outside the stores department attempt to break into the security of inventory control systems, whether they are connected to this hotel or not. However, the external risk is less than internal one because external attacks are expected to occur and therefore any electronic inventory control systems must be equipped with protection systems and protocols that work against attackers and security hacking attempts (Chathoth, 2007).

III) The risk of misuse: One of the reasons for maintain the protection of electronic inventory control systems is the fact that the human element should be scientifically trained and qualified. There are some errors resulting from the misuse by individuals of electronic inventory control systems that inflict serious damage on the security and integrity of data and information within those systems, whether such misuse is intentional or unintentional, and ultimately leads to the same result, so that it can be a window to breakthroughs in firewalls for these systems (O'Connor, 2008).

IV) The risk of natural disasters: Natural disasters such as earthquakes, volcanoes, explosions and fires are risks that the stores department may face without notice and which may affect the future operations of the works, so stores department staff must reserve data and make regularly backups containing all the required information of stores department operations, processes and transactions. These copies should be kept in places far from stores department so that information can be protected and retrieved in the event of any kind of these disasters (Dohertya et al., 2009).

V) Viruses: Viruses are one of the most common problems in information and networks security. The virus is a malicious or intrusive program that can affect the impact of electronic inventory control systems as it may slow down and cause interruptions and malfunctions that affect various programs and documents that a user may wish to access (Yildirima et al., 2011).

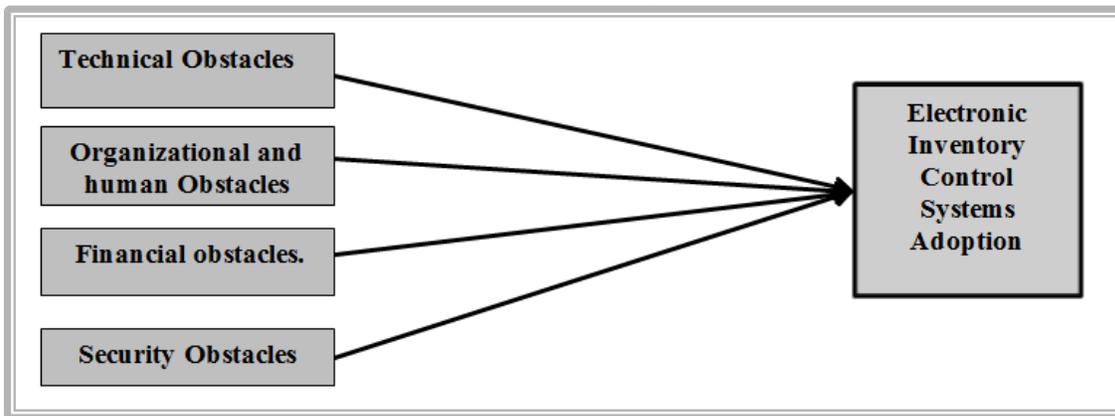
VI) Jamming risk: This refers to the factors affecting sending and receiving data and information through electronic inventory control systems. The information may be exposed to a type of jamming during transmission or reception by some of the equipment or programs that are used for such purpose. In some cases, this jamming is unintentional, i.e. it is caused by certain natural factors and conditions, such as weather and climate conditions that affect the transmission and reception towers, and at other times the jamming is an intended action by certain entities, there may be some lurking information over the networks. Those who try to jam information with signals similar to the same frequency bands used during transmissions may lead to the damage or loss to the inventory control systems data (Kumar, 2014).

### **Conceptual framework and hypotheses development**

The research framework aims to explain the study variables (see Figure 1), by illustrating the obstacles (Technical obstacles, Organizational and human obstacles, of Financial obstacles and Security barriers). The framework shows that there is an effect of obstacles on adopting electronic inventory control systems. The aforementioned explanations serve as a literature base, much needed in order to complete this research and test the following fourth hypotheses:

- H1: Technical obstacles have a statistically significant effect on adopting electronic inventory control systems.
- H2: Organizational and human obstacles has a statistically significant effect on adopting electronic inventory control systems.
- H3: There are statistically significant effects of financial barriers effect on adopting electronic inventory control systems.
- H4: There are statistically significant effects of security barriers effect on adopting electronic inventory control systems.

Figure 1: Conceptual framework of Barriers Facing Adopting Electronic Inventory Control Systems in Four-star Hotels



## Methodology

### *Data Collection Instrument*

Based on research model, which is also agreed with the literature, aims and hypothesis of the research, the questionnaire form was designed to collect the required data as it is the appropriate method to collect data in this case of participants. The questionnaire form data was presented to many academic professors specialized in the subject of the research to ascertain the correctness of the wording, the clarity of the terms, the proper order of the statements used, and the range to which they were answered. This was followed by designing the final questionnaire form after making minor adjustments.

The final questionnaire form consists of three sections. The first section deals with the respondents' demographic data such as gender, age, educational level, and occupation, while the second section discusses the degree of adopting electronic inventory control systems in stores department and include nine statements. The third section deals with the obstacles the face electronic inventory control systems implementation in stores department shedding light on technical, organizational and human, financial and security obstacles and the total number of these statements in this section is twenty-three. All variables in all sections of the questionnaire were measured using a Likert Five Rating Scale (1=Strongly Disagree, 2= Disagree, 3=Neutral, 4= Agree and 5=Strongly Agree).

### *Population and Sampling*

The range of the research is restricted to four-star hotels in Cairo. According to the statistics of The Egyptian Hotel Guide, 37th edition (2018-2019) the number of four-star hotels in Cairo is (30) hotels. As a result, the complete census method was adapted to the study population due to its small size. In order to achieve the objectives of the research, the researcher distributed one hundred and fifty questionnaire forms to stores department staff (stores manager, assistant stores manager, store-keeper, assistant store-keeper, and inventory controller) in four-star hotels located in Cairo. The number of valid questionnaires for analyzing is one hundred and thirty-six with the response rate was (90.6%).

Frequencies, means, standard deviation, regression and percentages were calculated. Then, Multiple Linear Regression was used to determine how groups differed significantly from each other. Therefore, reliability analysis was carried out to measure the results reliability of the questionnaire’s statements. SPSS (Version, 26) software was used for analysis data.

**Finding and discussions**

**Descriptive analysis**

The respondents’ personal data and properties are summarized using basic descriptive statistics such as frequencies and percentages to present a description of the gathered data. Table (1) illustrates the frequency and percentage of demographic features of respondents in the study sample.

Table 1: Demographic Data Analysis

| Variables                | Categories               | Frequencies | Percentages |
|--------------------------|--------------------------|-------------|-------------|
| <b>Gender</b>            | Male                     | 122         | 91.3%       |
|                          | Female                   | 14          | 8.7%        |
| <b>Age</b>               | From 30 to 40 Years      | 36          | 26.3%       |
|                          | From 41 to 50 Years      | 48          | 35.3%       |
|                          | From 51 to 60 Years      | 37          | 27.3%       |
|                          | 61 and More              | 15          | 11.0%       |
| <b>Educational level</b> | Moderate                 | 45          | 33.0 %      |
|                          | High                     | 64          | 46.7 %      |
|                          | Post                     | 27          | 20.3 %      |
| <b>Position</b>          | Stores Manager           | 29          | 21.3%       |
|                          | Assistant Stores Manager | 26          | 19.0%       |
|                          | Store Keeper             | 36          | 26.7%       |
|                          | Assistant Store Keeper   | 24          | 17.7%       |
|                          | Inventory Controller     | 21          | 15.3%       |
| <b>Work Experience</b>   | 1-5 Years                | 42          | 31.3%       |
|                          | 6-10 Years               | 58          | 43.3%       |
|                          | More than 11 Years       | 36          | 25.3%       |

Table (1) shows that 136 (91.3%) of respondents are males while only 26 (8.7%) are females, indicating that the majority of stores staff at stores departments within the targeted hotels are males.

In terms of age groups, it is noted from the above table that most respondents with a percentage (35.3%) are between 41 and 50 years old, (27.3%) of respondents are between 51 and 60 years old and (26.3%) of total respondents are between 30 and 40 years old. It is clear from these percentages that most of stores departments’ staff in hotels occupies the late youth category between 41 and 50 years old.

Concerning position properties of stores departments staff within the targeted hotels, it is evident from the table (1) that (26.7%) of the respondents are store keepers, (21.3%) of the respondents

are stores managers, (19%) of them are assistant stores managers and (15.3%) of total respondents are inventory controllers.

Regarding educational level, (46.7%) of respondents hold a higher education degree, (33%) of respondents have a moderate educational level and (20.3%) of respondents hold post studies degree. These results show that hotels are interested in employing higher education employees.

According to work experience years, it is obvious that most of the respondents are in the category (6-10 years) representing (43.3%) of the whole sample. This finding indicates the majority of employees are those of intermediate experience.

Table 2: Assessing the degree of adopting electronic inventory control systems in stores department in four and five-star hotels in Cairo

| The degree of adopting electronic inventory control systems in stores department.   | Mean        | Std. deviation | $\alpha$ |
|---|-------------|----------------|----------|
| 1. Stores department has a sufficient number of modern computer hardware that can be used to download electronic inventory control systems. | 1.8         | 1.16           | 0.89     |
| 2. Stores department adopts an electronic database system that helps to integrate all operations in stores department.                      | 1.64        | 1.46           |          |
| 3. Stores department uses some software applications such as (Word, Excel, PowerPoint, and SPSS).   | 3.8         | 1.16           |          |
| 4. Stores department uses the barcode devices in the various inventory control stages.  | 1.69        | 1.33           |          |
| 5. Stores department uses RFID tags (silicon chips) to track the inventory cycle of incoming and outgoing products.                         | 0.27        | 1.51           |          |
| 6. There is an advanced electronic link between stores department and other departments of the hotel.                                       | 2.80        | 1.44           |          |
| 7. There is a constant contact between the hotel and the suppliers via internet to ensure optimal stock levels.                             | 1.65        | 1.38           |          |
| 8. Stores department uses modern applications (software) to monitor inventory electronically.   | 1.94        | 1.35           |          |
| 9. The hotel has electronic point of sales systems that are constantly linked to inventory levels.  | 1.73        | 1.54           |          |
| <b>Total mean</b>   | <b>1.92</b> | <b>1.32</b>    |          |

Note:  $\alpha$ : Cronbach's Alpha Coefficient

The previous table, indicates that the respondents' means regarding these criteria ranged from (4.8) to (1.27), and the total mean regarding the degree of adopting electronic inventory control systems in stores department is (2.15) and its total standard deviation is (1.32). By comparing the total mean value to the Likert Scale, it is found that the value of the total mean is located between the values {disagree (4)} and {neutral (3)}, but it is found that the value of the total mean is closer to {disagree (2)} which indicates that the degree adopting electronic inventory control systems in stores departments within hotels under study in Cairo is above the average.

Based on what has already been mentioned, it is clear that the implementation of electronic inventory control systems in stores departments within the targeted hotels in Cairo has not reached its complete and optimal levels yet, in Four-star hotels.

There is no doubt that the use of electronic inventory control systems of different versions in stores departments at hotels is a necessity because of the nature of stores work on the one hand, and on the other hand, because of the advantages and benefits that this means can bring. This is also is consistent with what was approved by Davila et al., (2003) and Shah and Shin, (2007).

**Obstacles facing electronic inventory control systems adoption in stores department.**

Technical Obstacles

Table 3: Technical Obstacles facing electronic inventory control systems adoption in stores department

| Technical Obstacles  | Mean       | Std. deviation | $\alpha$ |
|--|------------|----------------|----------|
| 1. Lack of electronic infrastructure which includes the establishment of internal and external electronic networks.                          | 3.65       | 1.49           | 0.95     |
| 2. Stores department lacks accurate, integrated and up-to-date databases.  | 3.72       | 1.25           |          |
| 3. Incompatibility between available computers and some updated versions and applications of inventory software.                             | 3.64       | 1.44           |          |
| 4. Insufficient modern electronic means and devices such as bar code readers and scanners and RFID tags to control inventory electronically. | 3.74       | 1.31           |          |
| 5. The difficulty of Arabization of foreign electronic inventory control programs and applications.  | 3.81       | 1.3            |          |
| 6. Poor software updates and upgrades of electronic inventory control systems.   | 3.71       | 1.48           |          |
| 7. Poor electronic connectivity between the central stores management and its various branches   | 3.76       | 1.27           |          |
| 8. Poor electronic connectivity between stores department and different hotel departments.   | 3.60       | 1.38           |          |
| <b>Total mean</b>  | <b>3.7</b> | <b>1.3</b>     |          |

Note:  $\alpha$ : Cronbach's Alpha Coefficient

Data displayed in the table (3) illustrate that the total mean of technical obstacles facing electronic inventory control systems adoption in stores department is (3.7) and its standard deviation is (1.3). These results tend to reflect the respondents' acceptance relating the existence of technical obstacles that prevent and reduce the level of adopting electronic inventory control systems in stores departments, despite the importance of such electronic systems in inventory monitoring and controlling.

Based on table (3), it is also recognized that the mean value (3.81) is the greatest among the values shown in the previous table. This value was relevant to the point that the difficulty of the Arabization of foreign electronic inventory control programs and applications. This is also in the line of what was mentioned by Lawrence, (2016) who argued that although mastering foreign languages has become a necessity and an urgent requirement at the moment, especially in the era of the information revolution and progress in communication technology, which has been characterized by complete reliance on foreign languages such as English as being one of the most popular languages in the world, but it is also one of the most challenging obstacles that prevent the application of electronic inventory control systems due to the fact that the vast majority of inventory control applications based on foreign languages such as English. This constitutes a difficulty for many stores department staff when dealing with these applications because of the language barrier and that they are not proficient in these foreign languages such as English or have a superficial knowledge of them. With reference to the previous table, it was found that the smallest mean value is (3.60) and its standard deviation value is (1.38) which indicates the respondents' general agreement on the point that there is poor electronic connectivity between stores department and different hotel departments. This is agreed with what was affirmed by Deraman et al., (2012) who stated that the poor electronic connectivity between stores department and different hotel departments is considered one of the most critical technical obstacles facing electronic inventory control systems adoption in stores department.

Due to the complexity of the relationships of the stores department with the other departments in the hotel as purchasing department, production department, sales department .....etc., stores department is considered the main nerve of the hotel that ensures supplying the different hotel

departments with their needs from the stored materials based on providing other hotel departments with the necessary information about the inventory in its all stages through local networks and communications systems that link all hotel departments together. Therefore, it has become necessary to have an effective electronic connectivity and databases that link between the stores department and the other hotel departments to guarantee the instant information flow and ensure the correctness, accuracy and speed of transactions between the stores department and the other departments in the hotel.

**Organizational and Human Obstacles.**

Table 4: Organizational and human obstacles facing electronic inventory control systems adoption in stores department.

| Organizational and human Obstacles   | Mean       | Std. deviation | $\alpha$ |
|--|------------|----------------|----------|
| 1. Resistance of some workers to change and their lack of conviction regarding the benefits of using electronic inventory control systems. | 3.53       | 1.30           | 0.95     |
| 2. Employees' low confidence in their ability to use electronic inventory control systems.   | 3.69       | 1.32           |          |
| 3. Weak acceptance regarding the idea of using electronic inventory control systems by some employees.                                     | 3.36       | 1.20           |          |
| 4. Lack of some employees' experience and skills to use electronic inventory control systems and techniques.                               | 3.79       | 1.33           |          |
| 5. Poor English language skills of some employees, on which the language and techniques of electronic inventory Control systems are based. | 3.46       | 1.24           |          |
| 6. Employees' fear of accountability in case of failure of some electronic inventory control systems                                       | 3.56       | 1.19           |          |
| 7. Lack of training programs to qualify and train employees on using electronic inventory control systems.                                 | 3.62       | 1.36           |          |
| <b>Total mean</b>  | <b>3.6</b> | <b>1.3</b>     |          |

Note:  $\alpha$ : Cronbach's Alpha Coefficient

From table (4), it is recognized that the total mean of organizational and human obstacles facing electronic inventory control systems adoption in stores department is (3.6) and its standard deviation is (1.3). This emphasizes the agreement of the majority of participants in the surveyed stores departments on the point that although the human element is the back bone of adopting electronic inventory control system and the guarantee for achieving its desired aims and that electronic inventory control systems are nothing without the human element, the stores departments in the surveyed hotels still face many organizational and human obstacles that may limit or impede the application of electronic inventory control systems.

With regard to table (4), it is also recognized that the mean value (3.79) and its standard deviation value (1.33) is the most significant mean value among the values shown in the previous table. This indicates the respondents' general agreement on the point that there is a lack of some employees' experience and skills to use electronic inventory control systems and techniques.

Consequently, these results shown above are complied with what was mentioned by Ip et al., (2010) who stated that the modernity of electronic inventory control techniques and systems and their rapid development is not matched by the available expertise and skills of some in stores department staff in the surveyed hotels where the researcher noticed the availability of a limited number of stores department staff who are familiar with the basic skills of using computers and the internet, especially in some four-star hotels, in addition to weak English language skills and the awe of relying on electronic inventory control techniques completely which in turn

negatively affects the practical application of electronic inventory control systems in stores departments.

According to table (4), it is also obvious that the mean value (3.36) and its standard deviation value (1.20) is the smallest mean value shown in the previous table. This value was related to the issue that weak acceptance regarding the idea of using electronic inventory control systems by some employees. This is agreed with what Aziz et al., (2012) (2006) affirmed in relation to this point.

The weak acceptance of some stores departments staff in the surveyed hotels to the idea of adopting electronic inventory control systems emerges from their fears to lose their jobs or to shrink the number of employees because of jobs and tasks reduction plus the elimination of many jobs which caused by the transformation from adopting the manual inventory control systems to the electronic inventory control systems. This is in addition to the belief of some stores managers that the adoption of electronic inventory control systems represent a threat to their authorities. All of the previous ideas and beliefs lead to resistance from both stores departments' staff and managers to the idea of applying electronic inventory control technology.

**Financial Obstacles.**

Table 5: Financial obstacles facing electronic inventory control systems adoption in stores department.

| Financial obstacles   | Mean        | Std. deviation | $\alpha$ |
|---|-------------|----------------|----------|
| 1. Lack of financial allocations to improve the electronic infrastructure to facilitate the implementation of electronic inventory control systems.       | 3.65        | 1.32           | 0.91     |
| 2. High cost of some electronic inventory control systems devices and software.   | 3.53        | 1.20           |          |
| 3. Lack of financial allocations for conducting periodic maintenance of hardware and software components related to electronic inventory control systems. | 3.47        | 1.21           |          |
| 4. Lack of financial allocations dedicated to training and qualifying employees to implement electronic inventory control systems.                        | 3.62        | 1.26           |          |
| <b>Total mean</b>   | <b>3.57</b> | <b>1.25</b>    |          |

Note:  $\alpha$ : Cronbach's Alpha Coefficient

Based on the analysis of data shown in the table (5), it is clear that the total mean of financial obstacles facing electronic inventory control systems adoption in stores department is (3.57) and its standard deviation is (1.25). These findings indicate the respondents' acceptance on the point that the lack and insufficiency of funding and spending sources is one of the problems that face stores departments in the surveyed hotels and which negatively affect the optimal application and activation of electronic inventory control systems. The abundance of financial allocations is essential to enable achieving the desired results and goals from adopting electronic inventory control systems.

However, the stores departments in the surveyed hotels stand powerless due to the insufficient financial balances and allocations for electronic inventory control systems adoption, which in turns leads those departments to abandon some electronic inventory control applications and systems or not complete them despite what has been spent, which finally wastes time and effort without gaining any benefit.

Concerning table (5), it was also clear that the mean value (3.65) and its standard deviation (1.25) is the most significant mean value among the values shown in the previous table. This indicates the respondents' general agreement on the point that there is a lack of financial allocations to improve the electronic infrastructure to facilitate the implementation of electronic

inventory control systems. This is agreed with what was stated by Burgess, (2000) who confirmed that the insufficient financial allocations to improve the electronic infrastructure in terms of purchasing hardware and software applications, building sites, linking networks, and developing electronic inventory control systems might prevent the complete implementation of electronic inventory control systems.

This is in addition to the point that stores departments in the surveyed hotels are not following the scientific methods to determine their electronic inventory control requirements which should be done through a technical and economic feasibility study, which ultimately leads to a mismatch between the available capabilities and the actual needs of electronic inventory control applications and systems.

The results mentioned above illustrate that the mean value (3.47) and its standard deviation (1.21) is the smallest mean value among the values shown in table (16). This is emphasis participants' agreement on the point that the lack of financial allocations for conducting periodic maintenance of hardware and software components related to electronic inventory control systems.

This is also agreed with what was stated by Winata and Mia, (2005) regarding this point. They mentioned that the scanty in the financial allocations for the periodic maintenance of hardware and software related to electronic inventory control systems, such as malfunctions, speed of repair and preventive maintenance operations is a serious problem that may hinder electronic inventory control systems adoption. This is in addition to the problem of the speed of obsolescence of computers, which in most cases leads to significant changes in existing systems, which in turn requires the provision of large financial resources and a considerable period of time, which makes it challenging to make a correct assessment or a real feasibility study or other important decisions in relation to the satisfying electronic inventory control adoption.

**Security Obstacles**

Table (6): Security obstacles facing electronic inventory control systems adoption in stores department

| Security obstacles   | Mean       | Std. Deviation | $\alpha$ |
|--|------------|----------------|----------|
| 1. Lack of advanced software to ensure inventory information and databases confidentiality from hacking or sabotage. | 3.61       | 1.4            | 0.96     |
| 2. Some workers fear leakage, theft, destruction or piracy of some inventory information.                            | 3.67       | 1.39           |          |
| 3. Fear that some employees may disclose inventory information to some parties for financial benefit.                | 3.55       | 1.32           |          |
| 4. Fear of loss or inaccuracy of information when conducting updates to electronic inventory control systems.        | 3.58       | 1.30           |          |
| <b>Total mean</b>  | <b>3.6</b> | <b>1.33</b>    |          |

Note:  $\alpha$ : Cronbach's Alpha Coefficient

The results shown in table (6) clarified that the total mean of security obstacles facing electronic inventory control systems adoption in stores department is (3.6) and its standard deviation is (1.33). These findings indicate the majority of respondents agree on the issue that stores department suffers from security obstacles that threaten the security of inventory information when adopting electronic inventory control systems.

In relation to table (6), it is also realized that the mean value (3.97) and its standard deviation is (1.39) is the most significant value among the values shown in the previous table. This mean value related to the statement that some workers fear of leakage, theft, destruction or piracy of some inventory information which shed light on the point that fearing from leakage, theft,

destruction or piracy of some inventory information is the most serious problem facing electronic inventory information security.

These results disagreed with what was mentioned Nambisan and Wang, (2000) who stated that security and confidence of the information circulating within stores departments sections on the one hand and between stores departments and other hotel departments on the other hand are the basis on which the adoption of electronic inventory control systems relies. This is a result of the widespread use of information technology, and the surprising increase in communication and information networks in recent times, which has led to find systems and methods that are adopted protect stored information from penetration, hacking and sabotage whether internally or externally. The more the use of computers increases, the greater the need to protect the information stored in it.

In this concern, they added that guaranteeing inventory information security has become an urgent need for the stores departments in different hotels because that information represents the corner stone on which the stores work and transactions in any hotel depends. Thus, stores departments in different hotels seek to limit access to such data and protect them from penetration, hacking, modification, or sabotage.

With reference to table (6), it is also clear that the mean value (3.55) and its standard deviation is (1.30) is the smallest value among the values shown in the previous table. This value is that of the statement number three in the previous table. This illustrates that the stores departments' staff within the surveyed hotels fear that some employees may disclose inventory information to some parties for financial benefits.

This is agreed with what was shown by Sahadev and Islam, (2005) who stated that some personnel (or what are so called internal hackers) within stores departments may try to break into computer systems, especially in order to get confidential inventory information and disclose them to other hotels or individuals in order to gain some financial benefits or because of some personal problems between them and their managers or because that they are not satisfied enough with their work environment whether from professional, psychological or financial scope.

### **Regression Model and Hypotheses Testing**

The study has four main hypotheses to measure the effect of technical obstacles on adopting electronic inventory control systems (H1), organizational and human obstacles on adopting electronic inventory control systems (H2), Financial barriers effect on adopting electronic inventory control systems (H3), and security barriers effect on adopting electronic inventory control systems (H4).

From table (7), H1 is supported and technical obstacles have a significant effect on adopting electronic inventory control systems ( $\beta=-0.699$ ,  $p<0.01$  and  $R^2=0.22$ ). H2 is also supported; organizational and human obstacles have a significant impact on: adopting electronic inventory control systems ( $\beta=-0.157$ ,  $p<0.05$ ).

In addition, it is revealed that financial barriers were found affecting adopting electronic inventory control systems. ( $\beta=0.853$ ,  $p<0.01$ ). Furthermore, security barriers have a significant effect on affecting adopting electronic inventory control systems. (H4). It is found that security barriers affect the adopting process ( $\beta=0.212$ ,  $p<0.05$ )

Technical obstacles explain 78% of impact on adopting electronic inventory control systems, organizational and human obstacles explain 69% of the variance in adopting electronic inventory control systems, financial barriers explain 79% of variance in adopting electronic inventory control systems and security barriers explain 75% of variance in adopting electronic inventory control systems based on R-square values.

**Table (7): regression analysis**

| Model | variables                          | Unstandardized Coefficients |            | T      | R <sup>2</sup> | Sig. | Hypothesis      |
|-------|------------------------------------|-----------------------------|------------|--------|----------------|------|-----------------|
|       |                                    | B                           | Std. Error |        |                |      |                 |
| 1     | Constant                           | 3.642                       | .496       | 3.956  | 78             | .000 | H1<br>Supported |
|       | Technical Obstacles                | -.729                       | .067       | -.003  |                | .297 |                 |
| 2     | Constant                           | 2.451                       | .486       | .861   | 69             | .000 | H2<br>Supported |
|       | Organizational and human obstacles | -.213                       | .079       | -.150  |                | .781 |                 |
| 3     | Constant                           | 1.754                       | .388       | .958   | 79             | .000 | H3<br>Supported |
|       | Financial Obstacles                | -.081                       | .068       | -.700  |                | .485 |                 |
| 4     | Constant                           | 1.862                       | .345       | 3.174  | 75             | .000 | H4<br>Supported |
|       | Security Obstacles                 | -.185                       | .065       | -1.222 |                | .397 |                 |

**Dependent Variable: Adopting Electronic Inventory Control Systems**

From the previous table, for the first hypothesis, the alternative hypothesis was accepted, and the null hypothesis was rejected. Regarding the second hypothesis, the alternative hypothesis was also accepted while the null hypothesis was rejected. For the third and fourth hypotheses, the same result is reinforced as the alternative hypothesis was accepted while the null was rejected.

**Conclusion and Recommendations**

The results of the study concluded that the obstacles preventing the adoption of inventory control systems negatively affect the full and optimal adoption of electronic inventory control systems in the stores departments of the targeted hotels. This confirms that the more are the technical, organizational, human, financial and security obstacles, the less is the full and optimal adoption of electronic inventory control systems.

**Recommendations**

**The current study recommends the following:**

**Firstly: recommendations addressed to the top management at four-star hotels who should:**

1. Attract the outstanding human competencies in the field of electronic systems and services as the experts and technicians, to benefit from their expertise, whether in activating and developing these systems, training stores departments staff or resolving the obstacles that hinder the effective application of these systems.
2. Contract with pioneering companies in the field of information technology systems and software applications to ensure the quality of electronic inventory control systems and try to take an advantage of the follow-up procedures of those companies regarding conducting periodic maintenance and updating operations and providing the technical support to solve problems and respond to all inquiries that may face the adoption of electronic inventory control.
3. Purchase the most advanced and updated electronic inventory control devices and software applications that also guarantee the confidentiality of inventory information and databases from piracy or sabotage.

**Secondly: recommendations addressed to stores departments at four-star hotels who should:**

1. Cooperate with the top management to overcome all procedures and obstacles and enhance the optimal adoption of electronic inventory control systems.
2. Improve English language skills of stores department staff on which electronic inventory control systems depend by preparing English courses to improve the stores department staff's language levels, taking into account concentrating on some technical and technological terminologies related to such applications plus looking for the availability of Arabic versions

of these systems.

### Limitations and future research

Since the scope of the research lacks to researches and studies that address topics similar to the subject of the research, and in order to enrich this scope with relevant researches, the researcher suggests conducting many future studies in aspects that the current study did not address, such as applying this research topic on other hospitality industry establishments in Egypt, studying how to overcome obstacles and challenges of adopting electronic inventory control systems, and recognizing the factors needed to determined suitable devices and applications to be used for E-procurement to hotel establishments.

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