Maintenance Management Practices in 5-star Hotels
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Abstract
This study investigates maintenance management practices and identifies the barriers in implementing these practices in the Egyptian 5-star hotels. The study used the comprehensive sample. A total of 160 questionnaires were distributed to the maintenance mangers in the Egyptian 5-star hotels. The results indicated that the practices of ‘maintenance management plan’ and ‘maintenance management team’ play the most significant role in influencing their maintenance efficiency. The results also indicate that ‘Insufficient fund for maintenance job’, and ‘Lack of skilled personnel in maintenance department’ are the major barriers responsible for the poor implementation of maintenance management. This study provides guidance and references to enable the hotel operators to achieve better maintenance efficiency through various strategies and practices.

Keywords: Maintenance, Practices, Barriers, Hotel, and efficiency.

Introduction
Maintenance is the key for providing better built environment to building customers and users. Maintenance of the hospitality building is significant as its effectiveness will directly affect the quality of services, which have direct and significant effect on satisfying customers’ wants and expectations. Proper maintenance management is essential for hotel operations for many reasons including to (Borsenik, and Stutts, 1997; Chan et al 2001:2003; Hassanien and Looseket, 2002; Hassanien, and Baum, 2002; Mattila & O’Neill, 2003; Henley et al., 2004; Powell and Watson, 2006; Chan, 2008; Lee, and Scott, 2009a; Zawawi, et al., 2010; Lai, 2013):

a) maintain the capital invested and sustain reasonable investment return;
b) increase safety and security of hotel guests and employees;
c) ensure the availability/reliability of all the assets and services to customers;
d) keep or increase market share by satisfying the current or impending guests;
e) conform with the new trends and technology (e.g. the green movement);
f) conserve corporate image, appearance, historical and architectural values;
g) increase the operational stability and efficiency of the facilities and systems;
h) ensure energy expenditure (improving energy efficiency);
i) mitigate consequences of a natural disaster such as hurricanes/earthquakes;
j) meet governmental requirements like health and safety regulations;
k) carry on with the competition,  
l) ensure operation readiness of all equipment for emergency use; and 
m) to increase the life cycle of property & achieve minimum breakdowns.

Unfortunately, the background suggests that maintenance has been given a very low priority in most organizations. Such a lack of concern results in under-resourcing of maintenance which further affects building performance. Moreover, maintenance performance has been criticized in literature as being inefficient, unsatisfactory, and slow responsiveness for many reasons which include (Lee and Wordsworth 2001; Chan et al 2001: 2003; Francis et al, 2001; Hassanien and Looseket, 2002; El-Haram and Horner, 2002; Tse, 2002; Guilding, 2003; Henley et al., 2004; Tranfield and Denyer, 2004; Powell and Watson, 2006; Eti et al., 2006; Wu et al., 2006; Chanter & Swallow, 2007; Ruslan, 2007; Chan, 2008; Syed and Kamaruzaman, 2008; Lee, and Scott, 2009a,b; Zawawi, and Kamaruzzaman, 2009; Kamaruzzaman and Zawawi, 2010; Zawawi, et al., 2010; Lai, 2013):

1. Insufficient proactive maintenance strategies and as a result much of the manpower is wasted in performing the corrective maintenance.
2. Maintenance personnel are too focused on technical responsibilities than managerial, social, legal, financial, and inter-communication issues.
3. Maintenance performance is generally hard to measure, as it shouldn’t only consider quantifiable parameters but also the quality of the maintenance.
4. The lack of building maintenance objectives, which are not properly coordinated and not matching with organizational directions.
5. Hospitality facilities require higher maintenance cost than residential and industrial buildings, as they are more complex in construction & installation.
6. Lack of complete recordkeeping of hotels maintenance activities.
7. Rare research on maintenance for hotel facilities.
8. There is no unique maintenance strategy suitable for all types of buildings due to different characteristics like design, purposes, services, constructions.
9. The “African Poor Maintenance Culture”. The problem of maintenance management practices faces Africa as a whole. The problem with Africa was not its architecture but its poor maintenance practice. The challenge is to start promoting a ‘maintenance culture’ for all the people, such as to encourage people to love and care for the environment.
10. The maintenance of buildings and its systems are often neglected during the design and planning stage in project construction.
11. Other factors including lack of proper maintenance plans, inadequate funds, lack of knowledge about the maintenance strategies, inadequate maintenance
performance standard, and an absence of commitment from top management further exacerbate the problems of building maintenance.

All these factors puts increasing pressure on hotel managers and planners to consider the impact of improper maintenance and develop more effective practices to avoid hazards in the buildings or workplaces. An excellent practice of maintenance management is greatly needed to increase the life cycle of the property and to minimize unexpected breakdowns or deterioration effects, and vice versa. Therefore, the practices of the maintenance management have to be continuously reviewed and analyzed to ascertain a high quality service (Chan, 2008; Lee, and Scott, 2009a; Zawawi, et al., 2010; Lai, 2013). This article aims to unveil the challenges that cause poor maintenance in many hotel buildings. Despite maintenance importance, there is a lack of empirical research that evaluates the maintenance management practices from maintenance managers’ viewpoint in the hotel industry in general and in Egyptian hotels in particular. The study seeks to investigate the maintenance management practices and the barriers in implementing these practices in the Egyptian 5-star hotels.

**Research Questions (Statement of Problem)**

Therefore, the study problem can be formulated in the following questions:

1. What are the maintenance management practices hotels operators adopt for efficient delivery of services?
2. How maintenance managers perceive the importance of hotel maintenance management practices? And
3. What are the barriers faced by maintenance managers in implementing hotel maintenance management practices?

**Study Aim and Objectives**

The overall aim is studying maintenance-management practices in the Egyptian 5-star hotels from maintenance managers’ viewpoint in order to improve the understanding of practices and its efficiency. The specific objectives are to:

1. Identify maintenance management practices adopted for the efficient operation of hotels,
2. Assess the significance of maintenance management practices from maintenance managers' viewpoint,
3. Identify the barriers faced by maintenance managers in implementing hotel maintenance management practices, and
4. Develop a model of hotel maintenance management practices.
Review of Literature

Maintenance Definition

According to Seeley (1976), maintenance is defined as ‘work undertaken in order to keep, restore or improve every part of a building, its services and surrounds, to a currently acceptable standard, and to sustain the utility and value of the building. Maintenance is defined as “the effort in connection with different technical and administrative actions to keep a physical asset, or restore it to a condition where it can perform a required function (BSI, 1993). Maintenance defined by Lee and Wordsworth (2001) and Flores-Colen et al. (2010) as a combination of any actions carried out to retain an item in, or restore it to, an acceptable condition under BS 3811:1984 and ISO 15686-1. According to Lee, and Scott, (2009a,b), maintenance is a broad term, which describes maintenance responsibilities and specifies maintenance requirements. The main objective is to ensure the building assets are adequately maintained and perform effectively and efficiently. Lind and Muyingo (2009) also defined maintenance as “restoring to or retain to a state in which an item can perform an initially specified function and all actions aimed towards this are maintenance activities”. In the same vein, the engineering definition of maintenance by the Business Dictionary, (2016) terms it as ‘an actions necessary for retaining or restoring a piece of equipment, machine, or system to the specified operable condition to achieve its maximum useful life. It includes corrective maintenance and preventive maintenance’.

Francis et al. (2001) defined building maintenance management as: “An operation involving the interaction or combination of technical, social, legal and fiscal determinants that govern and manage the use of buildings.” Borsenik, and Stutts, (1997), defined managing maintenance and engineering systems for hospitality building(s) as: ‘design, construction, occupancy and use, repair, renovation, and disposal. Hospitality building engineering and maintenance systems include: life safety; heating; ventilation; and air condition; electrical; water; transportation; exterior; environment; and special facilities equipment’. According to this definition, the basic purpose of the department can be stated as: keeping the structure, its machines, its systems, and its products in an existing or specified state of readiness. This definition assumes that everything is kept in repair, that it is operating at a high efficiency level (low energy consumption), and that there are minimal breakdowns (Borsenik, and Stutts,1997).

Many hospitality operations defined maintenance by its areas of responsibility. Other operations rely on normal dictionary definitions. In some hospitality companies, the term has been combined under the heading of facilities management or engineering (Borsenik, and Stutts, 1997; Chanter and Swallow,
2007; Zawawi, et al., 2010). Regardless of the definition or responsibilities of an organization, four key components emerge from the development of the maintenance definition in both types of literature:

- Maintenance is not simply a series of technological or craft activities, but also requires considerable administrative and managerial expertise.
- Actions are those relates to the physical execution of maintenance work, initiation, financing and organization and implementation.
- It includes two processes: ‘retaining’, i.e. work carried out in anticipation of failure, referred to as ‘preventive maintenance’ and ‘restoring’, i.e. work carried out after failure, referred to as ‘corrective maintenance’.
- The setting of standards is also clearly identified as a requirement for the delivery of maintenance appropriate to the organization.

The Similarity of the Maintenance and Renovation Concepts in hotels
Seeley (1976) described renovations as a kind of maintenance which ‘consist of work done to restore a structure, service and equipment by a major overhaul to the original design and specification, or to improve on the original design, [Renovation] may include limited additions and extensions to the original building’. Renovation is the process of retaining or improving the hotel image by modifying the tangible products, due to many reasons (Hassasien and Baum, 2001). This process is confirmed by Lind and Muyingo (2009) when they stated that the meaning of maintenance as “restoring it to or retain a state in which an item can perform an initially specified function and all actions. This is done through changes in the hotel layout, such changes come in the form of new extensions and/or any additions or replacement of materials and furniture, fixtures and equipment. From the hospitality viewpoint, Stipanuk and Roffmann (1996) defined renovation as ‘the process of renewing and updating a hospitality property to offset the ravages of use and modify spaces to meet the needs of changing markets’. Hassanien and Baum (2001), from hotels perspectives, renovation is ‘the process of retaining or improving the hotel image by modifying the tangible product, due to a variety of reasons through any changes in the hotel layout (e.g. property structure-new extension) and/or any additions or replacement of materials and furniture, fixture and equipment’. In addition, renovation incorporates replacement, restoration and redesigning. This makes it a function of facility management that deals with the physical aspects of hospitality and not ‘soft’ service element. This definition is therefore similar to maintenance as it requires inputs from many parts and levels of the organization.
Facility Management and Maintenance Management

The International Facilities Management Association (IFMA) (2004) defined facilities management as, ‘the practice of coordinating the physical workplace with the people and work of the organization. It integrates the principles of business administration, architecture and the behavioral and engineering sciences’. The association also described facilities management as ‘a profession that encompasses multiple disciplines to ensure functionality of the built environment by integrating people, place, process and technology’ (IFMA, 2016). Chan (1997) identifies that the main areas of concern for facility management functions are organization, people and building facilities. Hassanien and Losekoot (2002) provided another definition as ‘the responsibility for coordinating efforts to ensure that buildings, technology, furniture and organizational trends are responded to, over time’. Okoroh et al. (2002) expressed a view on the relationship between facilities management and hotels. He defined facilities management in hotels as, ‘the management of constructed facilities and organizational assets to improve their efficiency and add value to their performance and services’. Facility management involves various types of disciplines and most studies discuss its very broad definitions (Pitt and Hinks, 2001; Best et al., 2003; Chotipanich, 2004). Although the scopes of facility management are very broad, it is more than the building operations and maintenance. Nutt (2004) defined facility management as the management of infrastructure resources and services to support and sustain the operational strategy of an organization. Thus, building operation and maintenance is within the facility management functions (Lee, and Scott, 2009).

Classification of Maintenance Management

As shown in Figure 1, Seeley (1987) divided building maintenance into ‘planned maintenance’ and ‘unplanned maintenance’. More recent study Chanter and Swallow, (2007), added more categories of building maintenance as follow:

1. Planned maintenance: “The maintenance is well organized and carried out with forethought, control and the use of records to a predetermined plan.”
2. Unplanned maintenance: “The maintenance implemented without predetermined plan.”
3. Preventive Maintenance: “The maintenance carried out at predetermined intervals of time and intended to reduce the probability of failure or unsatisfactory performance of an item.” This maintenance type relies on the predicted probability that the system, equipment or even a part of it will breakdown in a specific period of time.
4. Corrective maintenance: “The maintenance implemented after failure has occurred and intended to restore or repair an item to the state that can perform
its required function.” No maintenance work is carried out until there is failure. For instance, the water pump or centrifugal pump of the swimming pool is damaged and requires repair work.

5. Emergency maintenance: “The necessary maintenance to be implemented immediately in order to prevent further damage or serious impacts on an item.” For example, the repair of serious structural cracks is necessary to avoid further cracking/collapse.

6. Condition-based maintenance: “The preventive maintenance initiated as a result of knowledge of the condition of an item from routine or continuous monitoring and inspection.”

7. Scheduled maintenance: “The preventive maintenance implemented to a predetermined interval of time, number of operations, mileage and others.” For example, change of light bulbs or tubes for best performance according to their lifetime.

Figure 1: Categories of maintenance

Maintenance management has also been categorized by other studies into three maintenance procedures. Corrective maintenance (unplanned) approach which is a failure-driven maintenance referring to running equipment until unexpected event breakdown of equipment or malfunctioning. Preventive maintenance (planned) which entails time-based maintenance requiring regular task of maintenance irrespective of the condition of the item and thirdly condition-based maintenance which also entails periodic inspection of equipment to check it and replace it when a faulty condition is observed before breakdown (Richard et al 2000; Lind & Muyingo 2009) (Figure2).
Chan et al. (2003) and Chan (2008) further classified management of maintenance activities in hotels into four main categories: routine, corrective, preventive, and emergency. Routine maintenance refers to the daily activities with repetitive nature, such as taking meter readings, lubricating, monitoring, start-up, and shut-down. Corrective maintenance works are scheduled or unscheduled activities to restore the equipment to as-built functions. Preventive maintenance includes scheduled activities of inspection, adjustment, replacement and overhaul to prevent system breakdown and extend its useful life. Emergency maintenance refers to immediate actions to avoid further equipment damage and adverse consequences, such as loss of business.

**Research Methods**

This study investigates hotel maintenance management practices from maintenance managers’ viewpoint through assessing the significance of practices and assessing barriers responsible for poor implementation of these practices in the Egyptian five-star hotels.

**Study Hypotheses**

This study proposed that maintenance management practices significantly influence maintenance performance (efficiency). The study has two hypotheses:

- **Hypothesis 1** of this study is to test whether the maintenance management practices are statistically significant or not in improving maintenance management efficiency. Hence, the null and alternate of Hypothesis 1 are:
  - $H_0$ — There is no a statistically significant relationship at 0.05 level between the maintenance management practices and improving maintenance efficiency ($H_0: \mu < 3; p > 0.05$).
  - $H_1$ — There is a statistically significant relationship at 0.05 level between the maintenance management practices and improving maintenance efficiency ($H_1: \mu \geq 3; p \leq 0.05$).
Hypothesis 2 of this study is to test whether the influential barriers are statistically significant or not in poor implementation of maintenance management practices. Hence, the null and alternate of Hypothesis 2 are:

- $H_0$—There is no a statistically significant relationship at 0.05 level between the influential barriers and poor implantation of maintenance management practices. ($H_0$: $\mu < 3$; $p > 0.05$).
- $H_1$—There is a statistically significant relationship at 0.05 level between the influential barriers and poor implementation of maintenance management practices. ($H_1$: $\mu \geq 3$; $p \leq 0.05$)

Study Variables

34 Maintenance management practices and 10 maintenance barriers are the independent variables; meanwhile, maintenance efficiency and poor implementation are the dependent variables (Figure 3).

Research Type and Approach

This study uses Multi-method data collection. The study objectives and hypotheses revealed that this research study is primarily a descriptive-analytical study with qualitative and quantitative approaches. This research also has an exploratory aspect which included interviews with hotel managers from the industry. Furthermore, this study used deductive approach, since it develops a theory and hypotheses and then designs a research strategy to test the validity of hypotheses against the data. If the data are consistent with the hypothesis then the hypothesis is accepted; if not it is rejected. It moving works from the more general to the more specific (this call a top-down approach). This study used two approaches to data collection namely;
1. **Desk Survey (secondary data source).** The desk survey (literature review) forms an essential aspect of the research since it sets the pace for the development of field survey instruments using questionnaires, and interview. Secondary sources of information were identified and collected in books, articles, and professional periodicals, journals and databases on the subject of the study (Sekaran and Bougie, 2013).

2. **Field Survey (Primary Data Source).** The field survey is involved with the collection of empirical data. Fieldwork can be associated with three practical approaches; the survey approach, the case study approach and the problem-solving approach (action research) (Naoum, 2007). To achieve research objectives, a written survey questionnaire was chosen as the primary method of quantitative data collection to investigate maintenance management practices through assessing the importance level of practices and barriers. The researcher used surveys because according to Robson (2002), surveys are used for relatively large number of respondents within a limited time frame. This appears to be the most convenient way to obtain highest participation as people would be able to fill in the questionnaire during free time (Zawawi, and Kamaruzzaman, 2009). Questionnaire survey enhances consistency of observations and improves replication due to its inherent standardized measurement and sampling techniques (Oppenheim, 2003). The need for generalization in the findings across the hotel buildings influenced the choice of questionnaire survey.

A combination of data collection methods provides a way to gain in depth insights and adequately reliable statistics. The mixed methods approach allows researchers to address more complicated research questions and achieve higher reliability and validity for the research (Yin, 2009). Patton (2002) noted that using more than one data collection instrument strengthens and gives credibility to the study. As shown in Figure 4, the study was conducted in three phases over the time period of February 2016 to April 2016.

**Data Collection Instrument**

The questionnaire was developed based on the scale development procedures outlined by Hinkin et al. (1997) for developing reliable and valid measurement instruments in any hospitality industry field research setting (Figure 4). As shown in Figure 4, Hinkin, et al. (1997) have provided a seven-step process guide for scale development and analysis in the hopes that hospitality researchers will utilize a systematic approach to item and scale creation”

1. **Item Generation.** The creation of a sample of items to assess a construct under examination. Based on the literature review and limited consultation with industry experts and customers, a preliminary sample of items was
compiled that appeared to tap the construct’s various dimensions. Multiple items identified for each dimension to yield total of initial items.

2. **Content Adequacy Assessment.** Pretesting items for content adequacy is a necessary step in the scale development process. Once the scale has been developed it is the time to pretest the scale for the content adequacy of the items. Assuring content adequacy prior to final questionnaire development provides support for construct validity as it allows the deletion of items that may be conceptually inconsistent.

3. **Questionnaire Administration.** The retained items are then presented to an appropriate sample with the objective of examining how well those items confirmed expectations regarding the psychometric properties of the new measure. It assess the distinction or overlap among the proposed and existing scales. These would include measures with which the new scales would be hypothesized to be strongly related or unrelated to examine discriminant, convergent and criterion-related validity.

4. **Factor Analysis.** It helps to determine how many factors or subscales exist for a set of items. There are two basic types of factor analyses. The first is termed exploratory and is commonly used to reduce the set of observed variable to a smaller, more parsimonious set of variables. The second types is called confirmatory and is used to assess the quality of the factor structure by statistically testing the significance of the overall model (e.g., distinction among scales), as well as the relationship among items and scales. When using the inductive approach, exploratory factor analysis may be most helpful for identifying those items that load as predicted. For deductive studies confirmatory analysis may be most helpful, both type of analysis can be used, however, in both inductive and deductive studies.

5. **Internal Consistency Assessment.** After the exploratory and confirmatory factor analyses have been conducted and all ‘bad’ items have been deleted, the internal consistency reliabilities for each of the scales should be calculated. The most commonly accepted measure in field studies for assessing a scale’s internal consistency is Cronbach’s alpha which tells how well the items measure the same construct. If the number of retained items at this stage is sufficiently large, the researcher may want to eliminate those items that do not share equally in the common core dimension by deleting items that will improve or not negatively impact the reliability of the scales. The strong internal consistency reliability for the revised scales tell us that the retained items measure the same constructs. If a scale has low reliability it may be necessary to add or reexamine the existing items.

6. **Construct Validity.** It is the extent that the scale actually measures what is intended to measure. Reliability is a necessary, but not sufficient,
requirement for establishing construct validity. Content validity (see step 2) and internal consistency reliability (see step 5), both of which provide supportive evidence of construct validity. Validity was established by examining the scale for: (1) face or content validity (examined in step 2; a group of judges read the instrument and subjectively evaluated the degree to which items reflected the construct and (2) predictive validity or internal consistency (examined in step 5; the internal consistency of the scale, Item-to-total correlations, and factor analysis were used to assess the relationship between the instrument and other measures of the same construct.

7. **Replication.** The final step in scale development process is replication. It would be necessary to collect another set of data from an appropriate sample and repeat the scale-testing process with the new scales.
The final data-collection instrument consisted of three parts:

1. The first part assessed the significance of maintenance management practices in maintenance efficiency from maintenance managers’ viewpoint in the Egyptian five-star hotels. It consists of 34 practices representing six dimensions of maintenance management. Respondents were asked to rate each practice of the 34 practices in terms of the level of importance in maintenance management using a Likert scale ranging from 1-very unimportant (least) to 5-very important (highest). The significance of the
variables (practices) used was tested with the aid of t-test statistical tool at a critical value of 3. The variables (practices) were also ranked with the aid of the mean responses of the interviewed respondents.

2. The second part assesses the significance of barriers responsible for poor implementations of maintenance management practices from maintenance managers’ viewpoint. It consists of 10 barriers responsible for poor implementation of practices. It examined the importance level managers assigned to each barrier using a Likert scale ranging from 1-very unimportant (least) to 5-very important (highest). The significance of the variables (barriers) used was tested with the aid of t-test statistical tool at a critical value of 3. The variables were also ranked with the aid of the mean responses of the interviewed respondents.

3. The third part containing questions about demographic characteristics for members of the study sample. A cover letter in the message explained the purpose of the survey and general directions.

**Measurement Questionnaire Reliability and Validity**

The questionnaire were rationing/legalize before distribution to the study sample, so as to make sure of the validity and reliability of paragraphs as follows:

**A. Measuring Validity:**

In order to verify validity, the researcher relied on two forms of validity:

**Content Validity (Believe arbitrators):** The first version of survey questionnaire was judged by a group of arbitrators. A panel of four expert judges reviewed the measurement practices and its dimensions. Interviews with 4 experienced people in the field of hotel maintenance were done. These interviews were supplementary to the main data collection phase involving administration of a survey questionnaire to the study population. The interview observations have been used to assist with proposition development, questionnaire design and interpretation of survey findings. Revisions to the questionnaire were made based on feedback from the arbitrators. The researcher responded to the views of the jury and performed the necessary delete and modify in, after the light of the proposals recorded in the model is set up. Factors or questions with 80% approval and higher were only considered. The result was a revised version of the questionnaire with a smaller set of items. The changes made the statements more specific and easier to understand. 34 measures representing 8 dimensions has finally identified in the questionnaire. Thus, bringing out the survey in its final form to apply to the study sample.
Construct Validity
The researcher used two types of analysis for determining construct validity:
a. Correlational analysis.
b. Factor analysis, a multivariate technique that confirms the dimensions of the concept that have been operationally defined, as well as indicating which of the items are most appropriate for each dimension. (Sekaran and Bougie, 2013).

The researcher calculates the internal consistency of the attributes (practices) of the questionnaire by surveying it to the initial sample size of 24 respondents of the total members of the study population, and it calculates the correlation coefficients between each attribute (practice) of the questionnaire, and the total score for the domain dimension that belongs to him that attribute (practice) (the correlation coefficients between each practice of the first dimension and total score of practices of that dimension). The results showed that the value of the correlation coefficients of practices is ranged between (0.868, 0.620), and is statistically significant at the level of significance (0.05). Hence, the practices (attributes) of each dimension (factor) are considered honest/valid to measure its role in maintenance management. Since all practices (factors) are linked to each other and to the total degree of questionnaire, and this confirms that the questionnaire has a high degree of honesty/validity and internal consistency, and therefore there is not deleted any paragraph of the questionnaire which tolling (34) items. In addition, the factor loading for each practice is above 0.5.

B. Measuring reliability
The reliability of a measure indicates the extent to which it is without bias (error free) and hence ensures consistent measurement across time and across the various items in the measurement. (Sekaran and Bougie, 2013).

Inter-item consistency reliability
It is a test of the consistency of respondent’s answers to all the items in a measure. The most popular test of inter-item consistency reliability is Cronbach’s coefficient alpha. The higher the coefficient, the better the measuring instrument. According to Sekaran & Bougie (2013) almost in all cases, Cronbach’s coefficient alpha can be considered a perfectly adequate index of the inter-item consistency reliability. The researcher conducted reliability steps on the same initial sample using Cronbach's alpha coefficient. The results illustrated that the high reliability coefficients for questionnaire attributes (practices) where ranged from (0.79, 0.84). This means that all value coefficients is very high, so it is an indicator of the validity of the study tool (questionnaire) for application in order to achieve its objectives by answering its questions, suggesting the possibility of the stability/reliability of the results that can result
from the tool. The strong internal consistency reliability for the revised scales indicated that the retained items measure the same constructs. Thus, the researcher may be sure of the validity and reliability of the questionnaire, and it became valid in its final form for application to the basic study sample.

**Sampling Procedures**
The target population of this study was the maintenance managers at the Egyptian five-star hotels. The study used the comprehensive sample to ensure that the results represent the total number of maintenance managers. The study sample included all members of study population which totaling 160 maintenance manager in all the five-star hotels in Egypt (the Egyptian Hotel Guide 2010-2011). The questionnaire was distributed to members of the sample with rate 100% of the original members of the study population. A total of 160 questionnaires were distributed to the mangers in the hotel sample in February, 2015. From the sample, 122 questionnaires were returned, with a response rate of 76 %. Out of these 122 questionnaires, 9 were not included because of incompleteness. The valid number of questionnaires for analysis was 113, and the response rate was 70%. Researcher faced some obstacles marked by the refusal of some respondents fill in the questionnaire and the travel of some managers. This necessitated intensification of researcher visit to hotels more than once in an attempt to persuade respondents need to mobilize the questionnaire.

The surveyor contacted with each hotel in the sample and asked to meet the maintenance manager or the highest ranking maintenance’s employee in cases where there was no such manager. The surveyor gave him (or her) a written survey questionnaire. The manager could (1) complete the questionnaire on the spot and return it to the surveyor, or (2) ask the surveyor to return at a later time to pick the questionnaire. To assure an adequate response rate, an accompanying (cover) letter explained that the questionnaire was sponsored by Faculty of Tourism and Hotels as well as by Alexandria University. Additionally, the letter emphasized the significance of the issue under investigation, promised to release major findings to the respondents upon completion, and ensured confidentiality and appreciation for participating in the research. The token of appreciation was handed out to the respondents to encourage them to complete the questionnaire and to reduce the rate of incomplete questionnaires, which would not be valid.

Senior management was selected as the informant level because of the key role these individuals play in maintenance management. They do this by promoting an organizational maintenance culture by providing the leadership needed. In sum, the surveys were directed at senior level managers due to the nature of their role as chief executive decision-makers in maintenance management.
Ethical Considerations
Privacy and confidentiality were critical to the success and integrity of the study. The use of Informed Consent was practiced. Additionally, each participant received a cover letter that reiterated the information in the Informed Consent form, but also stressed that participation in the study was voluntary. The respondents were advised that the data collected would be used solely for the purpose to address the research topic. There were no anticipated risks to the respondents who participated in the study. The removal of any personal identifying information or data was the means to maintain confidentiality.

Data Analysis
The questionnaire survey analyzed using SPSS statistical program. The principal statistical tool utilized was the non-parametric statistical testing using descriptive statistics and one-sample t-test. The significance of the variables (practices-barriers) used was tested with the aid of t-test statistical tool at a critical value of 3. The relative importance/significance of the maintenance management practices and barriers was ranked through three stages:

1. Rank by the P.Value, so that the variables that have the less P.value, have greater importance and vice versa. If the variables are equal in the P.Value, these variables have ranked according to the second stage.
2. Sort by the value of the arithmetic mean of the sample. So that the variables that have the higher average, have greater importance. If some variables are equal in the average value of the arithmetic, discover which is better by the third phase.
3. Sort by the value of the standard deviation, so that the elements that have the less standard deviation, have greater importance. The result is presented in Table 1.
4. Finally, interpretation of the results was done at 5 %level of significance; where the value of p≤0:05 was considered as being significant, and p≤0:01 was considered as being highly significant.

Study Scope and Limitations:
The study seeks to explore the maintenance management practices and the barriers in implementing these practices in the Egyptian 5-star hotels. The focus of research is limited to the 5-star hotels in Egypt. The first limitation of this study is that it is limited to Egypt. The second limitation was the sample population. The study findings are limited to the maintenance managers of the Egyptian 5-star hotels. A third limitation is that the maintenance practices used in this study do not represent all possible measures that may be taken. In addition, because of the wide variety in the types, sizes, and locations of hotels,
not all suggested measures will be relevant or applicable. The ability to implement them at any specific facility will vary. The ideal number and structure of measures and dimensions could be different depending on the type of industry being studied, the service firm in question or the circumstances under which studies are rendered. Final limitation was the potential for researcher bias. Additional research should focus on these potential limitations in order to assure the most precise results.

Results and Discussion

Maintenance Practices and Its Role in Improving Maintenance Efficiency

As shown in Table 1, the importance mean scores of the 34 practices varied from 4.46 (the highest) to 3.41 (the lowest) out of a possible range of 1.0 to 5.0, with 1.0 indicating very unimportant and 5.0 indicating very important. Nevertheless, there was a distinction between the 34 practices and a priority of importance was evident. Fourteen (14) practices were perceived as most important with a mean greater than 4.20 (M > 4.20, on a 1 to 5 scale). It should be noted that these practices are related to two dimensions; “Maintenance Management Plan, and Maintenance Management Team”. Hotel managers believed that these measures play the most significant role in influencing their maintenance. This finding implied that hotel managers focus on these practices as the number one of priority which should also be the priority of hoteliers. Hence, hotel operators should put in more effort and attention to improve these practices when managing maintenance. Meanwhile, 20 practices were perceived as important with a mean greater than 3.40 and less or equal to 4.20 (4.20 ≥ M > 3.40, on a 1 to 5 scale). It should be noted that these measures are related to four dimensions; “Maintenance Knowledge-sharing & communication, Maintenance Monitoring Activities, Maintenance Training, and Maintenance Identification & Assessment”. This finding implied that hotel managers focus on these dimensions as the number two of priority. It is a managers’ second top priority in maintenance management which should also be the second priority of hoteliers. It should be noted, however, that these practices were also deemed important, but to a lesser extent. It should be noted, however, that these practices were also deemed important, but to a lesser extent and shouldn’t be disregarded when managing maintenance. Hence, hotel operators ought to take them into consideration and put in more effort and attention to improve these measures when managing maintenance.

Overall, it should be noted that the average importance mean of all maintenance management practices was ranged from 4.46 (the highest) to 3.41 (the lowest), which is greater than 3 (center-neutral) and also reached the significance level value of 0.000, which is less than 0.05. This finding indicates the significance
role of all 34 practices in improving maintenance efficiency in the Egyptian 5-star hotels. Respondents agree with the significance of practices because the calculated absolute value of T is greater than the spreadsheet value of T which is equal to 1.97 when the degree of freedom 112 (n-1) and level of significance 0.05 (or the significance level less than 0.05). This means that the percentage of the answers to (important or very important) is greater than the percentage of answers (not important or very unimportant).

The rankings in descending order of the importance mean scores of the 6 dimensions of the practices model in terms of its impact on improving hotels maintenance efficiency were as follow: Maintenance Management Plan (4.41), Maintenance Management Team (4.26), Maintenance Training (3.81), Maintenance Monitoring Activities (3.80), Maintenance Knowledge-sharing & Communication (3.74), and Maintenance Identification & Assessment (3.48).

The results indicated that the highly important measures are related to two dimensions; ‘Maintenance Management Plan, and Maintenance Management Team’ (M > 4.20, on a 1 to 5 scale). While, the important practices are related to four dimensions; ‘Maintenance Monitoring Activities, Maintenance Training, Maintenance Knowledge-sharing & Communication, and Maintenance Identification & Assessment’ (4.20 ≥ M > 3.40, on a 1 to 5 scale). Overall, it should be noted that the average importance mean of all maintenance management dimensions was ranged from 4.41 (the highest) to 3.84 (the lowest), which is greater than 3 (center-neutral) and also reached the morale level value of 0.000, which is less than 0.05 (the morale level). This finding indicates the significance role of all 6 dimensions in improving maintenance efficiency in the Egyptian 5-star hotels.

**Barriers Responsible for Poor Implementation of Maintenance Management Practices**

As shown in Table 2, the importance mean scores of the 10 barriers varied from 4.25 (the highest) to 3.66 (the lowest) out of a possible range of 1.0 to 5.0, with 1.0 indicating very unimportant and 5.0 indicating very important. Nevertheless, there was a distinction between the 10 barriers and a priority of importance was evident. Two barriers were perceived as most important with a mean greater than 4.20 (M > 4.20, on a 1 to 5 scale). It should be noted that these two barriers are ‘Insufficient fund for maintenance job’, and ‘Lack of skilled personnel in maintenance department’. This result indicates that the managers believed that these two factors are the major barriers responsible for the poor implementations of maintenance. Hotel managers believed that these barriers play a significant role in influencing their maintenance implementation. This finding implied that hotel managers focus on these barriers as the number one of priority which
should also be the priority of hoteliers. Hence, hotel operators should put in more effort and attention to avoid these barriers when managing maintenance. Meanwhile, 8 barriers were perceived as important with a mean greater than 3.40 and less or equal to 4.20 (4.20 ≥ M > 3.40, on a 1 to 5 scale). It should be noted that these 8 barriers are ‘Hotel owner/operator reluctance’, ‘Attitude of users and misuse of facilities’, ‘Inadequate and de-emphasize training, retraining and continue education’, ‘Frequent shortage of materials and spare parts due to inefficient inventory system or unavailable fund’, ‘Lack of skilled manpower to maintain work in buildings’, ‘Natural deterioration due to age and environment’, ‘Lack of discernable maintenance culture in the country’, and ‘Inflation of the cost of maintenance by the operatives’. This finding implied that hotel managers focus on these 8 barriers as the number two of priority, which should also be the second priority of hoteliers. It should be noted, however, that these practices were also deemed important, but to a lesser extent and shouldn't be disregarded when managing maintenance. Hence, hotel operators should put in more effort to avoid these barriers when managing maintenance.

Overall, it should be noted that the average importance mean of all barriers was ranged from 4.25 (the highest) to 3.66 (the lowest), which is greater than 3 (center-neutral) and also reached the significance level value of 0.000, which is less than 0.05. This finding indicates the significance role of all 10 barriers in poor implementation of maintenance efficiency in the Egyptian 5-star hotels. Respondents agree with the significance of barriers because the calculated absolute value of T is greater than the spreadsheet value of T which is equal to 1.97 when the degree of freedom 112 (n-1) and level of significance 0.05 (or the significance level less than 0.05 and the relative weight greater than 60%).
Table 1: Maintenance Practices and Its Role in Improving Efficiency

<table>
<thead>
<tr>
<th>Hotel Maintenance Management Practices and its Role in Maintenance Efficiency</th>
<th>One-Sample T-Test</th>
<th>Correlation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean(^a)</td>
<td>T value(^b)</td>
</tr>
<tr>
<td>1. Maintenance Management Team (MMT)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Have a sufficient &amp; multifunctional MMT responsible for maintenance work</td>
<td>4.42</td>
<td>8.59***</td>
</tr>
<tr>
<td>2. Appoint a MMT leader or a similar individual for all aspects of maintenance.</td>
<td>4.24</td>
<td>7.65**</td>
</tr>
<tr>
<td>3. Have an organizational administrative structure for maintenance management.</td>
<td>4.25</td>
<td>7.85**</td>
</tr>
<tr>
<td>4. Conduct regular MMT meetings between senior management/maintenance staff</td>
<td>4.21</td>
<td>7.43**</td>
</tr>
<tr>
<td>5. Use specialized out-source contractors for some maintenance work</td>
<td>4.22</td>
<td>7.54**</td>
</tr>
<tr>
<td>6. Recruit skilled technicians with good behavior and neat appearance</td>
<td>4.23</td>
<td>7.58**</td>
</tr>
<tr>
<td>2. Maintenance Management Plan (MMP)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Have a written MMP including maintenance policy, standard procedures/strategy</td>
<td>4.46</td>
<td>8.76**</td>
</tr>
<tr>
<td>8. Approving/commitment of top management (owner/operator) to MMP execution</td>
<td>4.43</td>
<td>8.63**</td>
</tr>
<tr>
<td>9. Involvement maintenance department in developing the maintenance plan</td>
<td>4.35</td>
<td>8.14**</td>
</tr>
<tr>
<td>10. Involvement maintenance experts at the design and pre-construction stage</td>
<td>4.37</td>
<td>8.25**</td>
</tr>
<tr>
<td>11. Review and update the MMP regularly at least annually</td>
<td>4.42</td>
<td>8.54**</td>
</tr>
<tr>
<td>12. Set aside yearly budget reserves for financing maintenance programs</td>
<td>4.44</td>
<td>8.65**</td>
</tr>
<tr>
<td>13. Well inform key employees about maintenance planning, resources and tools</td>
<td>4.38</td>
<td>8.33**</td>
</tr>
<tr>
<td>14. Commitment of manufacturers/suppliers to provide complete technical</td>
<td>4.40</td>
<td>8.48**</td>
</tr>
<tr>
<td>documentation to maintenance staff</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Maintenance Monitoring Activities (MMA)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>15. Carrying out daily maintenance activities with repetitive nature, such as</td>
<td>3.80</td>
<td>6.51**</td>
</tr>
<tr>
<td>taking meter readings, start-up/shut-down chillers, etc (Routine maintenance</td>
<td></td>
<td></td>
</tr>
<tr>
<td>approach)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>16. Carrying out the scheduled or unscheduled activities after a failure has</td>
<td>3.79</td>
<td>6.12**</td>
</tr>
<tr>
<td>occurred to restore to normal functions (Corrective/failure-driven</td>
<td></td>
<td></td>
</tr>
<tr>
<td>maintenance approach)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>17. Carrying out regular/scheduled activities at predetermined intervals of</td>
<td>3.82</td>
<td>6.63**</td>
</tr>
<tr>
<td>time (Preventive/time-based maintenance approach)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>18. Carrying out immediate maintenance actions of unexpected defects to avoid</td>
<td>3.79</td>
<td>6.25**</td>
</tr>
<tr>
<td>further damage or adverse consequences. (Emergency maintenance approach)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Maintenance Knowledge-sharing and Communication (MKC)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>19. Have computerized maintenance information system to organize maintenance</td>
<td>3.84</td>
<td>6.88**</td>
</tr>
<tr>
<td>work</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
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<tr>
<td>---</td>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>20. Have maintenance procedure checklists, protocols, work rules</td>
<td>3.82</td>
<td>6.76**</td>
</tr>
<tr>
<td>21. Have a well-equipped maintenance command center</td>
<td>3.80</td>
<td>6.42**</td>
</tr>
<tr>
<td>22. Have a toll-free maintenance hotline for guests and employees</td>
<td>3.80</td>
<td>6.36**</td>
</tr>
<tr>
<td>23. Any worker that sees a fault can initiate a printed or electronic work order.</td>
<td>3.65</td>
<td>5.19**</td>
</tr>
<tr>
<td>24. Schedule maintenance work which comprises the frequency and all details</td>
<td>3.66</td>
<td>5.28**</td>
</tr>
<tr>
<td>25. Recordkeeping maintenance of buildings, services, facilities, agreements, …etc.</td>
<td>3.60</td>
<td>4.99**</td>
</tr>
<tr>
<td>5. Maintenance Identification and Assessment (MIA) (3.48) (6.15**) (6) (0.69) (6)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>26. Identify and categorize current and potential maintenance problems and impacts due to facility management by brainstorm employees, examine history,…etc.</td>
<td>3.45</td>
<td>4.42**</td>
</tr>
<tr>
<td>27. Identify effective and quick means for reporting faults or problems occur</td>
<td>3.50</td>
<td>4.54**</td>
</tr>
<tr>
<td>28. Define and identify equipment and material needed, its specifications and default age (virtualization), as well as maintenance history, skilled labor needed, costs, implementation means and funding sources</td>
<td>3.41</td>
<td>4.22**</td>
</tr>
<tr>
<td>29. Evaluate and measure maintenance performance, follow-up actions, by using many methods such as post-occupancy evaluation, time variance, cost variance, system breakdown rate and others.</td>
<td>3.52</td>
<td>4.83**</td>
</tr>
<tr>
<td>30. Encourage building customers and employees to provide their evaluation opinions on the maintenance services provided by using many methods such as the feedback comment and complaint form, and others.</td>
<td>3.50</td>
<td>4.78**</td>
</tr>
<tr>
<td>6. Maintenance Training (MT) (3.81) (7.45**) (3) (0.72) (5)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>31. Conduct maintenance training (drills, seminars, workshops) on a regular basis at least annually to improve staff skills as well as to learn new technology</td>
<td>3.92</td>
<td>7.11**</td>
</tr>
<tr>
<td>32. Train new staff members when they join</td>
<td>3.70</td>
<td>5.48**</td>
</tr>
<tr>
<td>33. The commitment of the manufacturers or suppliers to provide training sessions</td>
<td>3.88</td>
<td>7.06**</td>
</tr>
<tr>
<td>34. Train housekeeping staff to help with maintenance delivery (especially at night) to change locks and batteries, fix of bulbs, when maintenance staffs have closed.</td>
<td>3.74</td>
<td>5.91**</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>3.91</strong></td>
<td><strong>8.25</strong></td>
</tr>
</tbody>
</table>

*Mean scale: 1—very unimportant to 5—very important. * Tabular value at a degree of freedom (112) and the level of significance 0.05 equal 1.97 (significant: *p ≤ 0.05; **p≤ 0.01). * Correlation between maintenance practices and improving maintenance efficiency at a degree of freedom (111) and the level of significance 0.05 equal 1.59 (significant: *p ≤ 0.05; **p≤ 0.01).
Table 2: Barriers Responsible for Poor implementation of Maintenance Practices

<table>
<thead>
<tr>
<th>Poor Maintenance Barriers</th>
<th>One-Sample T-Test</th>
<th>Person Correlation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean&lt;sup&gt;a&lt;/sup&gt;</td>
<td>T value&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td>B1. Attitude of users and misuse of facilities</td>
<td>4.10</td>
<td>7.57**</td>
</tr>
<tr>
<td>B2. Insufficient fund for maintenance job</td>
<td>4.25</td>
<td>7.96**</td>
</tr>
<tr>
<td>B3. Natural deterioration due to age and environment</td>
<td>3.77</td>
<td>6.55**</td>
</tr>
<tr>
<td>B4. Inflation of the cost of maintenance by the operatives</td>
<td>3.66</td>
<td>5.95**</td>
</tr>
<tr>
<td>B5. Lack of skilled manpower to maintain work in buildings</td>
<td>3.78</td>
<td>6.74**</td>
</tr>
<tr>
<td>designed and constructed by expatriates</td>
<td></td>
<td></td>
</tr>
<tr>
<td>B6. Frequent shortage of materials and spare parts due to</td>
<td>3.85</td>
<td>7.19**</td>
</tr>
<tr>
<td>inefficient inventory system or unavailable fund</td>
<td></td>
<td></td>
</tr>
<tr>
<td>B7. Lack of skilled personnel in maintenance department</td>
<td>4.21</td>
<td>7.76**</td>
</tr>
<tr>
<td>B8. Hotel owner/operator reluctance</td>
<td>4.15</td>
<td>7.61**</td>
</tr>
<tr>
<td>B9. Inadequate and de-emphasize training, retraining &amp; continue</td>
<td>3.92</td>
<td>7.28**</td>
</tr>
<tr>
<td>education</td>
<td></td>
<td></td>
</tr>
<tr>
<td>B10. Lack of discernable maintenance culture in the country</td>
<td>3.73</td>
<td>6.22**</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>3.94</td>
<td>8.11**</td>
</tr>
</tbody>
</table>

<sup>a</sup> Mean scale: 1—very unimportant to 5—very important.  
<sup>b</sup> Significant Correlation: *p ≤ 0.05; **p ≤ 0.01  
<sup>c</sup> T tabular value at a degree of freedom (112) and the level of significance 0.05 equal 1.97.

However, the results of this study indicated that ‘Insufficient fund for maintenance job’, and ‘Lack of skilled personnel in maintenance department’ are the most important barriers. Hassanien & Looseket (2002) in conducting a survey in the hotel market in Egypt observed that almost 70% of respondents stated that owners are the main barriers to renovation in both limited and full service hotels. This is followed by lack of money, lack of appropriate in house experience and lack of suitable manpower to renovate respectively (Figure 5). Their findings further revealed that hoteliers give more attention to intangible part of the hotel product (services like offering food and beverages) because creating value in intangible products was significantly higher than in tangible products. This confirms Guilding (2003) assertions that hotel owners pay more attention to profitability than brand image. The writers’ therefore concluded that there is a need for ‘greater articulation of goals and objectives’ when it comes to renovation.
However the results of this study indicated that preventive maintenance activities is the most important followed by corrective activities, routine activities, and emergency activities, respectively. As shown in Figure 6, Chan et al (2003) classified the relative portions of maintenance activities in the hotels. The results indicated that there was as much as 30 percent of the maintenance resources are spent on routine maintenance. However, the maintenance personnel often took an attitude of overlooking routine maintenance as something insignificant because they are not aware that routine maintenance and preventive maintenance, if properly carried out, would effectively reduce system breakdown. The observation is that the maintenance workforce is tied up with corrective work, which is commonly observed in hotels however in the writers” opinion for long-term improvement; management must turn their attention from corrective maintenance to preventive maintenance.

Testing hypotheses
As shown in Table 1, the results of the Person correlation indicated a positive and statistically significant relationship at 0.05 level (p ≤ 0.05) between the level of importance managers assigned to each practice and its role in improving maintenance efficiency. The Person correlation coefficient
between all 34 practice and its role in improving maintenance efficiency ranges from 0.78 to 0.51 and a significance level 0.000 which is less than 0.05. Similarly, there is a positive and statistically significant relationship between all six dimensions and its role in maintenance efficiency, which ranges from 0.82 to 0.69 and a significance level 0.000 which is less than 0.05.

Since, the correlations for the all 34 practices, and also for the six dimensions, are all positive and statistically significant at 0.05 level (at \( p \leq 0.05 \)). Hence, the null hypothesis 1 which proposed an absence of relationship was therefore rejected. Meanwhile, the alternate hypothesis 1 which proposed an existence relationship, was therefore accepted. This finding indicated that there is agree between hotel managers on the significance role of these 34 practices (and its six dimensions) in improving maintenance efficiency in the Egyptian 5-star hotels. This finding indicated that managers are overall consistent in the importance role of these 34 practices in improving maintenance management efficiency. There is a certain level of consistency in the maintenance management behavior of managers. These practices were the challenges and require the most attention by hotel managers in their efforts to make some maintenance improvement. By understanding and investigating those practices. It is easier for management to control and take corrective action to reduce the difference between the importance and usage level of practices. These practices should command more attention and that need to be improved. This finding implied that further improvement resources and efforts should concentrate here. Therefore, hotel planners should consider allocating resources (i.e., money, time..), especially on these 34 practices of maintenance management, to yield a higher return.

As shown in Table 2, the results of the Person correlation indicated a positive and statistically significant relationship at 0.05 level (\( p \leq 0.05 \)) between the level of importance managers assigned to each barrier and its role in poor implementation of maintenance practices in the Egyptian 5-star hotels. The Person correlation coefficient of 10 barriers is ranges from 0.78 to 0.61 and a significance level 0.000 which is less than 0.05. The p-value (significance level) to all barriers is less than 5% (significance level).

Since, the person correlations for the 10 barriers are all positive and statistically significant (\( p \leq 0.05 \)). Hence, the null hypothesis 2 which proposed an absence of relationship was therefore rejected. Meanwhile, the alternate hypothesis 2 which proposed an existence relationship was therefore accepted. This finding indicated that there is agree between hotel maintenance managers on the significance role of these 10 barriers in poor implementation of maintenance practices in the Egyptian 5-star hotels. This means that all barriers are significance in poor implementation of maintenance practices in Egyptian 5-star hotels from maintenance managers’ viewpoint. This result
implied that there is a certain level of consistency in the poor maintenance management behavior of managers. This finding indicated that managers are overall consistent and that they consider the significance of these barriers in poor implementation of maintenance practices. These barriers were the shortfalls (challenges) and require the most attention by hotel managers in their efforts to make some maintenance improvement. By understanding and investigating those barriers. It is easier for management to control and take corrective action to avoid these gaps. These barriers should command more attention and that need to be improved. This finding implied that further improvement resources and efforts should concentrate here. Therefore, hotel planners should consider allocating resources (i.e., money, time...), especially on these 10 barriers of maintenance management, to yield a higher return.

Conclusion and Recommendations
This study investigates hotel maintenance management practices from maintenance managers’ viewpoint through assessing the significance of practices and assessing barriers responsible form poor implementation of these practices in the Egyptian five-star hotels. The maintenance managers of the Egyptian 5-star hotels were given 34 practices ad 10 barriers to choose between very unimportant and very important. The significance of the variables (practices- barriers) used was tested with the aid of t-test statistical tool at a critical value of 3. The results indicated that the average importance mean of all maintenance management practices was ranged from 4.46 (the highest) to 3.41 (the lowest), which is greater than 3 (center-neutral) and also reached the significance level value of 0.000, which is less than 0.05. This finding indicates the significance role of all 34 practices in improving maintenance efficiency in the Egyptian 5-star hotels. The results of the Person correlation indicated a positive and statistically significant relationship at 0.05 level (p ≤ 0.05) between the level of importance managers assigned to each practice and its role in improving maintenance efficiency. Hence, the null hypothesis 1 which proposed an absence of relationship was therefore rejected. Meanwhile, the alternate hypothesis 1 which proposed an existence relationship, was therefore accepted. On the other hand, the results indicated that the average importance mean of all barriers was ranged from 4.25 (the highest) to 3.66 (the lowest), which is greater than 3 (center-neutral) and also reached the significance level value of 0.000, which is less than 0.05. This finding indicates the significance role of the 10 barriers in poor implantation maintenance practices in the Egyptian 5-star hotels. This shows the importance of barriers in the poor implementation of practices. The results of the Person correlation indicated a positive and statistically significant relationship at 0.05 level (p ≤ 0.05) between the level of importance managers assigned to each barrier and its role in poor implantation of maintenance
practices in Egyptian 5-star hotels. Hence, the null hypothesis which proposed an absence of relationship, was therefore rejected. Meanwhile, the alternate hypothesis which proposed an existence relationship, was therefore accepted.

This research study is important because not only would it be contributing to the knowledge by adding a theoretical model of maintenance management practices, but will also contributes to good maintenance management practice in the Egyptian 5-star hotels, particularly. The study will assist the management of hotels to enhance the understanding of maintenance practices and their efficiency. The study would enable hotel managers to determine which practices of maintenance should require more attention on achieving efficiency and effectiveness as a significant way for managing maintenance. It will also endeavor to investigate the barriers that contributed to the poor implementation of maintenance management practices. The practices described in this paper would hopefully be applied to provide guidance and references for better building maintenance management system for Egyptian hotels. The findings of this research are expected to (contribute) enable the hotel operators to achieve better maintenance efficiency through various strategies and practices. The results of study provide useful recommendations for hotel managers or policy makers for improving and developing maintenance management strategies and practices in the future. This study serves as an impetus for additional studies in other nations and locations that will enhance the understanding of hotel maintenance practices and their effectiveness.

Future Research Recommendations

As technology improves and maintenance features are expanded, additional research may be necessary to further validate and examine the generalizability these findings.

- Studying maintenance practices from both tenants and staff viewpoint
- Future studies can extend the same examination to other locations and other tourism and hotel sectors to improve the robustness of the findings.
- This research can be extended to include broader types of hotels (e.g., 3, and 4-star hotels) to test whether the guests' importance level and performance level of security measures will vary between types of hotels.
- It can be expanded to include a broader application of IPA for a comparison of maintenance practices for independent versus chain hotels, male versus female, leisure versus business, and 4-star versus 5-star hotels.
- Future research studies should identify and examine the maintenance management knowledge and training necessary for hotel staff.
- Research is needed on the relationship between the levels of maintenance management practices, and hotel's size, star rating, branding or nationality.
• Studying the difference between planning of maintenance types: scheduled, corrective, proactive, reactive maintenance.

• The need to measuring the performance of maintenance, particularly in these indicators such as time, cost, and quality. There is a need to discuss these four measurement indicators for maintenance performance.

Acknowledgement

I thank Allah (God) for granting me the guidance, patience, health and determination to successfully accomplish this work. I would like to consider maintenance in more depth in a forthcoming special issue and would welcome any comments on how this might best be structured.

References


ملخص

ممارسات إدارة الصيانة في فنادق الخمس نجوم

كرم منصور غازي

المعهد العالي للسياحة والفنادق كينج مريوط – كلية السياحة وإدارة الفنادق جامعة فاروس

تبحث هذه الدراسة ممارسات إدارة الصيانة وتحدد العوائق في تنفيذ هذه الممارسات في الفنادق المصرية ذات الخمس نجوم. استخدمت الدراسة عينة شاملة حيث تم توزيع 160 استبانة على مدير الصيانة في الفنادق المصرية ذات الخمس نجوم. وأشارت النتائج إلى أن ممارسات "خطة إدارة الصيانة" و "فريق إدارة الصيانة" تلعب أمراً في التأثير على كفاءة إدارة الصيانة. كما أشارت النتائج إلى أن "نقص التمويل لقسم صيانة"، و "نقص العمالة الماهرة في قسم الصيانة" هي العوائق الرئيسية المسؤولة عن سوء تنفيذ إدارة الصيانة. وتعد هذه الدراسة التوجيهات والارشادات والمرجعيات التي تمكن مشغلي الفنادق لإدارة الصيانة بكفاءة من خلال تقديم الاستراتيجيات والممارسات المختلفة لإدارة الصيانة.

الكلمات الدالة: الصيانة، الممارسات، العوائق، فنادق، الكفاءة.