The Reality of Cloud Computing at Saudi Airlines Information Center: A Case Study

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Abstract

This article aims to identify the reality of cloud computing in Data Center of Saudi Airlines, and to understand the concept of cloud computing, its inception, characteristics, roles, advantages, disadvantages, types, benefits and challenges when used, as well as to identify its role and its advantages in the performance of employees, and then to identify the problems and difficulties faced by employees of Data Center in Saudia Airlines, from their own point of view. The researchers used the descriptive analytical approach. One online questionnaire has been applied to the current research community, including all the staff in Data centre at Information Technology Sector in Saudi Arabia - Jeddah. The study community consists of 85 employees of the Data Center at the Saudia Airlines. The most important findings of the study show that the cloud computing helps to reduce the burden of routine functional as it allows employees to work effectively, assists in the speed of access required data from anywhere, at any time and at a tremendous speed. It also reduces the costs of periodic maintenance and reduce the operational burdens of legacy systems. One of the most important difficulties faced by cloud computing; it needs strong network architecture, and that users are worried about the privacy of the data and heightened security concerns when used.

Keyword: *Cloud Computing, Saudi Airlines Information Center.*

1. Introduction

The tremendous growth in the volume of data and information is one of the ability of organizations, whether governmental or private, to manage these data and information effectively, and while continuing to increase the costs of storage, this makes these organizations face problems in retrieving this data and preparing backups, where the development of information technologies used in administrative and training processes requires significant costs, in addition to the costs of new hardware and software. From this standpoint, the use of modern information technologies has become a necessity, such as Cloud Computing Technology, which represents the new solution to these problems, as the employee can, through cloud computing, access applications from any place and time, and from any device connected to the Internet, as well as access to Database and social networking applications, through a variety of computers or its mobile device. Therefore, the success of the application and use of cloud computing has become an important factor for the success of organizations, and therefore increased pressure on information systems to provide users with adequate basic services, so organizations need to improve the technology used by them in order to benefit workers in them from rapid developments that raise the efficiency of the performance of government sector employees [1]. From here, the idea of research will

crystallize in identifying the reality of cloud computing in the information center of Saudi Airlines. The objectives of this study are as follows:

- Understanding the extent of interest in applying cloud computing in the information center of Saudi Airlines.
- Determining the role of cloud computing on the performance of employees of the Information Center of Saudi Airlines.
- Understanding the reasons that prompted the information center of Saudi Airlines to use cloud computing.
- Realizing the advantages of cloud computing from the point of view of the employees of the Information Center of Saudi Airlines.
- Defining the obstacles facing the application of cloud computing in the information center of Saudi Airlines.

Many institutions, including Saudi Airlines, face challenges represented by the rapid change in technology and its developments and the accompanying increase in the volume of intellectual production and the diversity of its topics and sources, which led to the emergence of many problems facing Saudi Airlines, the most prominent of which is providing storage space for data and information and the diversity of Methods' Processing. In addition to information flow and methods of its transmission and participation in benefiting its form, therefore, the information technology sector in Saudi Airlines is considered one of the most important pillars of the company as it contributes to raising the level of other sectors technically. Technically, this required the Saudi Airlines to change the traditional method of computing and replace it with the contemporary method, which is cloud computing to serve its guests and employees using the latest technologies, in line with the 2030 Vision adopted the government of the Custodian of the Two Holy Mosques, whose goal is to provide smart services to all sectors of the country. In light of the importance of the role of cloud computing in Saudi Airlines, this study comes to identify the reality of the use of cloud computing in Saudi Airlines and to identify the advantages and benefits of using them, in addition to understand the difficulties we all encounter when using them. Based on the lack of studies dealing with cloud computing in the information center of Saudi Airlines, according to the researchers' knowledge; this study came out of whose problem crystallized in the following main question: What is the reality of cloud computing in the information center of Saudi Airlines?

The following sub-questions branch from the following question have an essencial issue:

- What is the extent of interest in the application of cloud computing in the information center of Saudi Airlines?
- What is the role of cloud computing on the performance of employees of the Information Center of Saudi Airlines?
- What are the reasons that prompted the information center of Saudi Airlines to use cloud computing?
- What are the advantages of cloud computing from the perspective of employees of the Information Center of Saudi Airlines?
- What are the obstacles facing the application of cloud computing in the information center of Saudi Airlines?

From the point of view of the importance of this research work, the framework of the continuous efforts to develop the services system and facilitate travel procedures, Saudi Airlines seeks to motivate guests to use the modern technical means that have been provided,

which are represented in the website [2] and applications of smart devices and self-service devices, as it aims to reduce pressure on termination platforms Airport check-in procedures; thus saving time and effort for guests as crucial. As these procedures require large areas to store data and information that are available when used, and to provide these storage spaces it was necessary to use the cloud computing platforms of all kinds. Hence, to give the recent application of cloud computing technology in Saudi Airlines, it was necessary to reveal the actual reality of cloud computing in an aviation organization that had not such a study before. The importance of the problem lies in focusing on the reality of cloud computing in the information center of Saudi Airlines. The importance of this study is reflected in the fact that cloud computing is one of the most important modern technologies that a major revolution is expected to develop and improve the performance of organizations for their role in providing distinct programs and applications and very large storage spaces and monitoring and preserving data safely and at the lowest cost. The importance of the study is based on highlighting the current situation in the Information Center Section of Saudi Airlines to know the opinions of employees towards cloud computing in Saudi Airlines. More than that, applying what is the addition or benefit provided by cloud computing in Saudi Airlines, and knowing whether there are pros or cons resulting from the use of this cloud computing in light of the increased volume of data and information for Saudi Airlines are all available. Its importance is determined by the fact that it is considered one of the first Arab studies to address the views of Saudi Airlines employees on the use of cloud computing and to know the extent of its application in the information center of Saudi Airlines. Because of that, the importance of the current research is highlighted by its being:

- It coincides with the state's orientations in the national transformation program (Vision 2030) in view of the Saudi information technology sector, as the Kingdom will pump more investments in the digital economy until it tops its place, so cloud computing is one of the modern technologies in the business sector and governmental departments.
- This research may contribute a scientific addition to researchers and scholars in the field of information and technical systems through knowledge of the role of cloud computing and its relation to the performance of employees in general and the governmental and private sector in particular.
- The results of the research may benefit the administrative leadership in organizations and officials of modern technologies in all organizations of the importance of the role of cloud computing in raising the efficiency of the performance of governmental and private sector employees, in particular the organization to which Saudi Airlines belongs.

2. Related Works

Many researchers went to study cloud computing and its applications due to the novelty and importance of the topic, so this part of the study will address a presentation of previous studies that were available to the researchers through a review of Arab and foreign intellectual productions on the subject of this study. The researchers review studies related to the current study from 2009 until the date of preparing the study 2019, and these studies will be addressed in ascending order from the oldest to the newest according to publication date as follows:

- The article [3] entitled: "The Impact of Computerized Management Information Systems on the Performance of Workers in the Palestine Telecommunications Company." The study aims to know the perceptions of workers in the company towards the direction of computerized management information systems and their impact on the

performance of employees in the company, and to know the impact of demographic variables on employees' perceptions of job performance in the company, and also to identify the level of employee performance in the company. In this study, the researcher relied on the descriptive analytical approach in order to conduct a desk survey, to review theoretical and field research, and to conduct an exploratory research and data analysis. This study has reached a number of results, the most important of which are: that administrative information has a significant impact on job performance, and that the material requirements for computerized management information systems are good, easy to use, and the company works to keep pace with accelerated technological developments, and a statistically significant relationship has been found between financial requirements and manage information systems and the performance of employees in the company. There is a relationship between software requirements and the performance of workers in the company because of the appropriateness of the software used and its response to the user's needs and workplace. This study is consistent with the current study in the study of the impact of computerized management information systems on the performance of workers in the Palestinian Communications Company, and the current study studies cloud computing in the information center of Saudi Airlines and agrees with the current study in the use of the descriptive approach in order to reach the objectives of the study.

- Study in [4] entitled: "The Impact of Cloud Computing Technology on the Reality of Institutions and Libraries in Benefiting from the Services and Applications Provided." This study aimed to study the effect of cloud computing technology on institutions and libraries and the possibility to benefit from services and cloud computing applications. The researcher followed the descriptive analytical method. It is to describe cloud computing technology and its applications. The sample of the study consisted of students of the Department of Information Science whose questionnaire was applied in order to get to know the effect of cloud computing technology on libraries and benefit from their services, and after analyzing the data the results of the study showed that the reality of users' knowledge of cloud computing technology is less than expectations and aspirations, and that the effectiveness of applications based on technology Cloud computing in the provision of services for libraries and institutions. The results also reached the importance of using cloud computing technology in institutions and libraries and benefiting from its services and technologies. This study is consistent with the current study in the major of the impact of cloud computing on the provision of libraries and institutions services, while our study aims to study cloud computing in the information center of Saudi Airlines. This study is consistent with the current study in the descriptive approach in order to reach the objectives of the study.

- The paper [5] entitled: “Open Source Cloud Computing System: A Comparative Analytical Study”. This study seeks to answer the following questions: What are the pros and cons of cloud computing? How does cloud computing relate to the open source? How different are the services of the open source cloud computing system? This study aimed at identifying the main components of cloud computing, reaching its pros and cons and reaching the relationship between it and open source, and also analyzing open source cloud computing systems. To achieve the goals of the study, the researcher used three approaches: First, the historical approach in order to describe and record the events that cloud computing went through. Second, a systematic analysis approach to study open source cloud computing systems with a comprehensive view.

Finally, the comparative approach for comparing open source cloud computing systems to reach the differences between systems. The results of the study showed that the Eucalyptus System provides a widespread software platform through information technology organizations and technological business for infrastructure as a service, and that the Open Nebula System is an open source tool for cloud computing, as it manages the beneficiaries, virtual operating system images, services and storage, in addition to OpenStack excels in its error handling ability, by providing infrastructure services, and includes cloud servers. The results also found that the deployment environment of the systems differs, as Eucalyptus provides a wide range of devices for the beneficiaries, followed by the Open Neiola system, then the Nimius system comes in third place, and cloud computing systems are similar in the management of virtual simulations. This study is consistent with the current study in its analysis and its trend towards the use of cloud computing, but it aimed to use open source cloud computing, as it differed with the current study in the approach used. It used the historical approach, the systems analysis approach, and the comparative approach while our current study uses the analytical approach to reach its goals.

- The work [6] entitled: "The Possibility of Using Cloud Computing Technology in E-learning at the Qaseem University." This study aims to know the possibility of using cloud computing technology in order to develop the skill of self-learning for students of the College of Sharia and Islamic Studies and spread the spirit of motivation to participate in learning by means of internet applications, as well as keeping pace with trends in modern education development and increasing the effectiveness of education and making the learners more educated. The study community consisted of an experimental group of female students who practiced e-learning for the introduction to the computer introduction course using cloud computing technology, and they numbered 30 students, and the teaching was done using the learning method anywhere and anytime. After analyzing the data, the results of the study showed that the majority of the study sample agreed on the ease of using cloud computing technology and its availability anywhere and any time, and the availability of many advantages in its applications such as interaction and cooperation, the possibility of using communication tools and creating documents, sharing and collaborative work in them, and that the use of cloud computing achieves a lot of Advantages for universities such as: Reducing academic problems such as overcrowding, lack of equipment, saving costs compared to the regular system, and achieving the quality of educational science. The study also found that Microsoft and Google provide many programs and services for the education sector through e-learning applications and cloud computing. This study is consistent with the current study on the possibility of using cloud computing technology in education and the importance of using electronic applications in order to increase the effectiveness of self-education, and also identified the possibility of using computer technology and cloud computing to remove fear and increase interest in modern technology, and our current study will also examine the reality cloud computing in the information center of Saudi Airlines as a new and additional sphere in Data fields.
- The article [7] entitled: “Ways to Benefit from Cloud Computing Applications in Providing Information Services in The United Arab Emirates.” This study posed two questions that the study problem was identified through, namely: How to benefit from cloud computing in the information service in libraries? Also, what is the future of cloud computing in the United Arab Emirates and its impact on the library

environment? This study seeks to know the concept of cloud computing and its applications, to determine its advantages and disadvantages; to determine its capabilities and how to benefit from it in the field of information services. To know its applications that are used in the Emirates, and to study the possibility of using them in information centers and libraries, in this study, the researcher used the descriptive analytical approach, in order to know the applications of cloud computing, its challenges and how to benefit from them in the library environment. The results of the study showed that cloud computing plays an important role in the field of information technology in all areas of life, as it provides cloud computing technology 30-60% of expenditures in libraries, and libraries have started to use cloud computing technologies through standard indexes and open source software, and that The United Arab Emirates' market is ready to embrace modern technology, and the use of cloud computing technologies effectively and efficiently. This study is consistent with the current study in the search for how to take advantage of cloud computing technologies. The current study aims to study the reality of cloud computing in the Information Center for Fonts in the Kingdom of Saudi Arabia. Clouds play an important role in the field of information technology in all areas of life, which is consistent with the objectives of the current study, which aims to find out the reasons that prompted the information center to implement cloud computing in Saudi Airlines, and evaluate its effectiveness.

- The work [8] entitled: "The Effectiveness of Teaching a Unit in Computer Using Cloud Computing Applications in Developing Information Literacy for Second Secondary Class Students." This study examined the objectives of identifying the cloud computing applications that need to be applied and defining the foundations of their use in order to teach the computer courses to high school students. Knowing the requirements for female students to interact with the computer unit according to cloud computing applications, and also studying the effectiveness of using cloud computing technology on developing information literacy for students. In this study, the researcher relied on the semi-experimental approach, through the presence of an experimental group and a control group to which the scale of informational knowledge is applied before and after. The study sample consisted of two experimental groups, the experimental sample was 32 female students, and the control sample was 31 female students. The results of the study reached a statistically significant difference between the experimental group and the control group scores in favor of the experimental group, which confirms the presence of a positive impact on the development of information literacy among students, and the presence of differences in the application of the information literacy scale in favor of the experimental group, which indicates the importance of cloud computing technology in teaching. also, there are statistically significant differences between the degrees of pre- and post-application of the literacy scale of the experimental group in favor of the post-application, which confirms the existence of a relationship between the level of information literacy and the use of cloud computing technology. This study is consistent with the current study in its positive direction towards the use of cloud computing technology, while the current study is the reality of cloud computing in the information center of Saudi Airlines in Jeddah, but it differed with the current study in the approach use. We used the semi-experimental approach while the current study also uses the descriptive approach form, in order to know the extent of interest in the application of cloud computing in the information center of Saudi Airlines in Jeddah.

- In [9] entitled: "A Conception of Managing the Educational Process for Graduate Programs Using Computing". The study aims to develop a vision for managing the university educational process in order to benefit from cloud computing technology services, and use it to facilitate graduate students' access to scientific research, libraries and lectures, and to create interaction among students, as a result of managing the educational process, as well as contributing to providing and reducing the costs of purchasing hardware and software. To achieve the goals of the study, the researcher used the descriptive approach in order to develop a concept for managing the educational process for postgraduate programs using computing. The results of the study showed the importance of entering the cloud computing technology in Sudanese universities, and the provision of the scientific research portal special services for researchers in Sudanese universities through cloud computing technology. It is possible to take advantage of the cloud computing technology and employ it in order to develop a vision for the university as an educational management system, in general. This study is consistent with the current study on the importance of entering cloud computing technology at many universities, as our current study revolves around the importance of applying the information center for cloud computing in Saudi Airlines in Jeddah. So, it also used the descriptive approach in order to reach to develop a concept for managing the university's educational process in order to benefit from technical services' Cloud Computing, and our current study also uses the descriptive approach to access to assess cloud computing in the information center of Saudi Airlines in Jeddah though.
- The work [10] entitled "Cloud Computing and its Relationship to the Performance of Government Sector Employees." The study aimed to identify the extent of the interest of the Ministry of Education in the use of cloud computing, its role and advantages in employee performance, and then to identify problems and difficulties facing employees in the Ministry's Information Technology Department. In this study, the researcher used the descriptive analytical approach, and applied an electronic questionnaire to the sample of the subject from workers in the General Administration of Information Technology in the Ministry of Education in Riyadh. The results of the study showed that cloud computing contributed to solving administrative problems with high efficiency, and raising the efficiency of staff performance in the Ministry of Higher Education, which has a positive impact on developing their performance and accomplishing tasks with accuracy, speed and high efficiency. In addition, the use of cloud computing is characterized by a high degree of flexibility due to its ability to update, develop and access data easily and reduce the risk of losing it or losing digital content. The results also found that cloud computing reduces the infrastructure represented by computers due to its dependence on fewer electronic devices and technologies. The study recommended the necessity of setting controls and regulations for work mechanisms and procedures in the cloud computing, as well as adopting incentive programs for employees financially and morally to motivate them to join them, and include the curricula in universities and institutes with scientific materials to know the cloud computing and its importance. This study agreed with the current study on the extent of interest of government sectors in the application of cloud computing and study the relationship between cloud computing and the performance of government sector employees, and is consistent with the current study in the use of the descriptive approach in order to reach the objectives of the study.

- In [11] entitled: "Applications of Cloud Computing in the Deanship of Information Technology at King Abdulaziz University." This study aimed to find out the applications of cloud computing used in information technology at King Abdulaziz University in Jeddah, determine its quality and identify the features, difficulties and challenges facing the university when applying cloud computing techniques. In this study, the researcher used the descriptive analytical method through the case study of the Deanship of Information Technology at King Abdulaziz University in Jeddah. The sample of the study consisted of the directors of the Deanship of Information Technology in Jeddah, and a questionnaire was distributed to them. The results of the study concluded that cloud computing can be a solution to many of the technical problems facing the Deanship of Information Technology, and the majority of managers of the Deanship of Information Technology in Jeddah have tended to use cloud computing technology, as there are a number of challenges facing the Deanship of Information Technology in Jeddah in applying technology of cloud computing, including weak means of securing the display and transmission of data on the Internet. This study is consistent with the current study in its positive orientation towards cloud computing technology and its communication because cloud computing can be a solution to many technical problems, and it also used a descriptive analytical approach such as our current study.
- The article [12] entitled: "The Impact of Cloud Computing on Enterprises Architecture and Project Success". The study aimed to clarify the impact of the use of cloud computing technologies on enterprise structuring and enterprise success, and study the effect of cloud computing on developing a theoretical model based on the theory of cloud computing and enterprise structuring in order to verify the health of experts within several different organizations that have adopted cloud computing in their core business operations. This study has reached a set of results, the most important of which are: there is a positive effect of cloud computing on the details of project implementation in institutions, so the technology of cloud computing is considered as a mean for providing services to clients effectively and easily. And the importance of overcoming the obstacles to using cloud computing technology in order to benefit from them. In implementing projects in enterprises, it is, therefore necessary to adopt cloud computing technology. In order to obtain the best results and project success, the costs, time and implementation are used. This study reached the necessity of adopting the cloud computing technology to obtain the best results and the success of the project, which makes it consistent with the current study in the goals, and the positive direction towards the technology of cloud computing.
- In [13] entitled: "Cloud Computing Evaluation - How it Differs to Traditional IT Outsourcing", "Cloud Computing Assessment and how it differs from traditional IT resources". This study seeks to evaluate cloud computing techniques as an alternative that can be used from the traditional use of information technology sources in terms of opportunities and advantages in their use and use as a substitute for traditional methods, and to study the degree of difference of cloud computing techniques from old information technology sources. The researcher used the descriptive approach in this study, and he also interviewed three companies specialized in information and communication technology to study their general opinion and evaluate cloud computing. The researcher used the method of open interviews to obtain accurate information on the subject. It is the result of this study that it clarified the important

concepts, which must be analyzed accurately when assessing the techniques of cloud computing, and a broad technical explanation was also provided towards the technology of cloud computing and its peculiarities. In addition to assessing and identifying the main strengths and weaknesses in order to rely on cloud computing technology, setting a framework and looking at its characteristics for adopting the use of cloud computing technologies. This study aimed to evaluate cloud computing technologies as an alternative that can be used from the traditional use of information technology sources. To evaluate cloud computing technologies in terms of opportunities and advantages in their use and use as an alternative to traditional methods, and to study the degree of difference of cloud computing techniques from old information technology sources, is the main issue. The current study refers to the reality of cloud computing in the information center of Saudi Airlines, and the study agreed with the current study in using the analytical method as a method of study in order to reach the goals.

- The paper [14] entitled "Cloud Computing for Distibuted University Campus", "Using Cloud Computing Technology in Universities". This study aims to introduce the importance of using cloud computing technology in universities in Turkey and determine services, models and design methodologies for them, and study the benefits of using them in universities, and also provide a proposed model for the use of this technology in the university that includes colleges in places far apart. In addition, it included the proposed community cloud computing model for the university, the application of both infrastructure as a service, methodology as a service, and programs as a service too. The results of the study showed the importance of using cloud computing technology in E-learning in universities in order to overcome the obstacles of high costs of building and developing information systems, and also to overcome the problems of the existence of university colleges in many places far apart by providing a proposed model for the use of this technology in faraway places. In addition to implement both the infrastructure as a service, the methodology as a service, and the programs as a service are basics. This study is consistent with the current study in studying the importance of using cloud computing. It aimed to study its importance in universities, while the current study aims to study its importance in the information center of Saudi Airlines.

- The Study of [15] entitled "Private Cloud for Collaboration and E-learning Services", "Building a Private Cloud E-Learning Model". The study aimed to build a special cloud for Ford Motor Company in Germany for college students in order to use it in designing their projects and duties during the semester and conducting quarterly and final exams. Also, building a proposed cloud computing model that includes (infrastructure as a service, methodology as a service, and programs as a service), in addition to defining the requirements and needs of E-learning at universities and including the infrastructure model as a service, it is proposed to use virtual machines through the design of the shibboleth program. The results of the study showed that the program that was designed provides the necessary storage space for storing students' projects and is characterized by flexibility, and is suitable for modern applications. This program is characterized by ease of downloading and managing by students, the presence of a unified environment for students' activities and projects, the proposed program does not require additional capabilities for managing accounts users, and does not need much storage space. The proposed program relies on the use of virtual machines in the infrastructure layer as a service. The results also showed the importance of increasing the use of cloud

computing technology in E-learning, especially in technical and engineering colleges. This study agreed with the current study in the positive direction towards cloud computing. It proposed a program for building a private cloud for Ford Motor Company in Germany for college students in order to use it in designing their projects and duties during the semester and conducting quarterly and final tests through it. Building a proposed cloud computing model that includes on the infrastructure as a service, the methodology as a service, and the programs as a service, are the same; while the current study aimed to study the importance of applying cloud computing in the information center of Saudi Airlines.

- The article [16] entitled "A Cloud Modal for Educational E-content Sharing", "A Cloud Computing Model for Sharing Educational Electronic Content". This study seeks to design a model of cloud computing in order to share the electronic content of images, text files and educational videos through the storage layer as a service, and then to make a comparison of traditional web applications and the proposed computing model for sharing and analyzing electronic content, and suggest a model in order to ensure easy access to and sharing educational electronic content. The results of the study showed the importance of using cloud computing technology in E-learning, and facilitating it to access and share educational electronic content anywhere and anytime. So, it is necessary to create an IT infrastructure in universities in order to save very high costs. This study proposed a model to ensure easy access to educational electronic content, comparison with traditional web applications and cloud computing model for content sharing and analysis. Therefore, this study is consistent with the current study on the importance of relying on cloud computing technology as a modern model of technology.
- The work [17] entitled "Cloud Computing's Effect on Enterprises in Terms of Cost and Security", "Cloud Computing and its Impact on Organizations in Terms of Cost and Data Security." This study aimed to know the effect of cloud computing on the public company in Turkey and to study the desire of institutions there to shift towards working with cloud computing technologies, as to study the areas most influencing the use of cloud computing technologies which are cost and data security. The study used the interview method tool, and prepared three sample questions for the study sample from the employees of the General Company in Turkey and were interviewed to reach the study goals. The results of the study showed that there is still confusion about defining cloud computing in a specific and clear way, and that the institutions that use network computing have more ability and response to understand cloud computing. But institutions face a cost barrier when thinking about using cloud computing technologies. There are a large number of factors that affect the cost of using cloud computing in organizations. The study recommended that large institutions and companies must rely on cloud computing technologies in order to maintain the security of their data, and that institutions can save their capital, reduce cost by not building their data centers, and not employ staff to manage them in order to adopt cloud computing which leads to a significant cost reduction. This study found that there is confusion in the definition of cloud computing for large companies, as well as the existence of a cost barrier to the use of cloud computing technology, but the current study aims to find out the reasons that prompted the information center in Saudi Airlines to apply cloud computing.
- In [18] entitled: "Cloud Adoption Model for Governments and Large Enterprises". This study aimed at adopting the cloud computing model as a model for use by governments

and large companies, and studying the orientation of these large institutions and governments to cloud computing, and knowing the steps that they have taken to adopt cloud computing technology, formulating a model for adopting the application of this technology, in addition to identifying emerging patterns. It is to explore cloud computing application drivers. This study reached a number of results, the most important of which are: that public and private sector organizations have a great knowledge of cloud computing technologies and capabilities, as they look to work and spread this technology and use it and put together a proposal for adopting a cloud computing model to help public and private sector organizations understand the required capabilities. They provide organizations cloud computing technologies, respectively. Some organizations have made significant progress in the potential to attract and implement cloud computing. This study is consistent with the current study in studying the trend towards the use of cloud computing, and studying the steps that must be taken in order to adopt the cloud computing technology, the adoption of cloud computing as a model for use.

- The work [19] entitled "Factor Analysis of the Adoption of Cloud Computing in Nigeria", "Analysis of Cloud Computing Accreditation Factors in Nigeria". This study aimed to determine the perception of specialists in the field of information and communications technology between companies and users of devices that support the use of cloud computing as the next generation of computing technologies. Furthermore, it is to study the extent to which information and communication technology companies rely on them, in addition to knowing the motivating factors and current issues that affect the adoption companies on cloud computing in Nigeria. The researcher used a quantitative and qualitative research methodology, and designed two electronic questionnaires, which were distributed to an IT company. He identified telecommunications staff, IT managers and people who are aware of cloud computing, and questionnaires were distributed to them through an online survey application. All the interviews were conducted through Skype with some employees and IT managers. This study reached a number of results, the most important of which are: the majority of the study sample endorsed the ease of accessing data at any time anywhere when using cloud computing technology, and that its use will lead to a reduction in the numbers of workers in the departments of information technology and will provide devices, programs and applications, and that managing relationships with (Software as a Service) is considered one of the most used cloud computing services in Nigeria. In addition, cloud computing technologies will represent the next generation of information technology in Nigeria. For that reason, it is necessary to focus on factors that help to adopt cloud computing technologies in Nigeria such as basic services, cooperation, providing basic infrastructure and determining data access and ease. The results also showed that there were factors that significantly affected the adoption of cloud computing in Nigeria such as poor awareness of cloud computing, unstable power supplies, high cost of internet bandwidth and Internet reliability. Based on these results, the study identified a number of recommendations that must be taken care of, including: the need to provide proper awareness of cloud services technology and its risks and benefits, in order to increase interest in them and increase the demand of companies to use them, and that the provision of cloud services providers in large numbers, trained and experienced will encourage Increased use of cloud computing technology, and also, a free trial cloud should be provided for customers for a prescribed period in order to encourage companies to use cloud computing technology. This study is consistent with

the current study on the importance of using cloud computing and making use of its technologies, and the need to focus on factors that help to adopt cloud computing technology, but they differ from it in the approach used only.

Through the presentation of previous studies, we find that there are many Arab and foreign studies that dealt with the variable of cloud computing technology in order to study its effect on some of the dependent variables such as [11] study, which dealt with cloud computing applications in the Deanship of Information Technology at King Abdulaziz University. And, we reached the direction of the majority of the directors of the Deanship of Information Technology in Jeddah to use the cloud computing technology. There are numbers of challenges facing the Deanship of Information Technology in Jeddah in the application of cloud computing technology, including weak means of securing the presentation and transmission of data on the internet, and that cloud computing can be a solution to many of the technical problems facing the Deanship of Information Technology. another study [9] that dealt with the perception of managing the educational process for graduate programs using mathematical computing, and concluded that it is possible to take advantage of cloud computing technology and employ it in order to develop a perception of university educational management. The importance of entering Cloud Computing Technology in Sudanese universities, and the scientific research portal must provide special services for researchers in Sudanese universities through computing technology loud. The study [8] dealt with the effectiveness of teaching a unit in the computer using cloud computing applications in developing information literacy for second-year students in the second year, we found a positive impact on the development of information literacy among students, and the importance of cloud computing technology in teaching. The existence of a relationship between the level of information literacy and the use of cloud computing technology, as [7] examined ways to benefit from cloud computing applications in providing information services in The United Arab Emirates, and concluded that the United Arab Emirates has a market which is ready to embrace modern technology, and the use of technologies of cloud computing effectively and efficiently. That cloud of computing plays an important role in the field of information technology in all areas of life. As libraries began to trend to use cloud computing technologies through standard indexes and open source software, we found in [6] addressed the possibility of using cloud computing technology in E-learning at the Qaseem University. We also found the ease of using cloud computing technology and its availability anywhere, any time, and the availability of many advantages in cloud computing applications such as interaction and cooperation. The possibility to use communication tools and create documents and share and collaborative work in them, and achieve many advantages for universities through the use of cloud computing such as reducing academic problems such as congestion and the lack of devices and saving expenses compared is now applicable. With the regular system and achieving the quality of educational science, we also find from [5] which dealt with open source cloud computing systems, and reached a different environment for deploying systems, as Eucalyptus provides a wide range of devices for the benefit of users, followed by the Open Neiola System. Then, the Nemius system comes in third place, cloud computing systems are similar in virtual simulation management, as we find in [4] that examined the impact of cloud computing technology on the reality of institutions and libraries, and came to the reality of the users of knowledge of cloud computing technology came less than expectations. Aspirations and the effectiveness of technology-based applications cloud computing in providing services for libraries and institutions, and the importance of using cloud computing technology in institutions, libraries, and interrogations are of its services and technologies. We find [3] that dealt with the impact of computerized

management information systems on the performance of workers in the Palestinian Telecommunications Company, and reached material requirements for computerized management information systems that are good, easy to use. The company works to keep pace with accelerated technological developments. The presence of a statistically significant relationship between the financial requirements for the management of information systems and the performance of employees in the company. The existence of a relationship between software requirements and the performance of workers in the company because of the appropriateness of the software used and its response to the needs of the user.

We also find a number of foreign studies that have dealt with cloud computing technology as an independent variable and have a great impact on our study as [19] aimed to analyze the factors of cloud computing adoption in Nigeria, and reached easy access to data anytime anywhere when using cloud computing technology. Techniques cloud computing will represent the next generation of information technology in Nigeria, that the use of cloud computing technologies will lead to a reduction in the number of employees in the IT departments and will provide hardware, software and applications too. The most used cloud computing service in Nigeria is related to management with (software as a service). The need to focus on the factors that help in adopting cloud computing technologies in Nigeria such as basic services, cooperation, providing basic infrastructure and determining data access and ease, poor awareness of cloud computing, unstable energy supplies, high cost of internet bandwidth and Internet reliability factors influenced significant dependence on cloud computing in Nigeria. We also find from [18] that computing model cloud as a model for use by governments and large number of companies, which have come up with public and private sector organizations looking to work and deploy cloud computing technologies and their use. Some organizations have made significant progress in the ability to attract and implement cloud computing, and a proposal has been developed for the adoption of a cloud computing model to assist public sector organizations. The private sector's understanding of the capabilities required by cloud computing technologies provided to organizations, as we find the study of [16] that dealt with a model of cloud computing in particular.

3. Study Methodology and Procedures

In order to achieve the aims of the study, the researchers relied on conducting this study on descriptive approach survey. The descriptive approach survey is based on "collecting data and information from the individuals representing the study community in question. This means that the process of collecting information is affected by the multiplicity of people and their differing opinions on the subject of the research" type of curriculum and research which carried out by interrogating all members of the research community or a large sample of them. The aim of describing the phenomenon studied in terms of its nature and degree of existence only, without exceeding that to study the relationship or infer the reasons.

4. Resuts and Discussion

Staff questions:

a- The first question: How interested is the information center in implementing cloud computing in Saudi Airlines?

To answer this question, recurrences, percentages, arithmetic averages, standard deviations, and grades for the responses of study members from employees of the Information Center Department of the Information Technology in Saudi Airlines were calculated on the

axis of how the information center is interested in applying cloud computing in Saudi Airlines, and the results are as follows:

Table 1. The responses of the study members from the employees of the Information Center Department of Information Technology in Saudi Airlines on the phrases of the axis (the extent of interest of the information center in the application of cloud computing in Saudi Airlines)

Degree of Approval	Order	Standard Deviation	Average	Degree of Approval								**Phrase**	S
				Strongly Agree		Agree		Disagree		Strongly Disagree			
				%	K	%	K	%	K	%	K		
agreed	١	٠,٥٢	٣,١٨	٢٣,٥	٢٠	٧٠,٦	٦٠	٥,٩	٥	٠	٠	The management of the information center bears the risks of applying cloud computing in order to reap the desired benefits from cloud computing.	٢
agreed	٢	٠,٤٨	٣,٠٩	١٥,٣	١٣	٨٠	٦٨	٣,٥	٣	١,٢	١	Auxiliary systems for storing, organizing and retrieving data on demand.	٤
agreed	٣	٠,٥١	٣,٠٢	١٢,٩	١١	٧٧,٦	٦٦	٨,٢	٧	١,٢	١	The management of the information center is kept abreast of the technical developments of cloud computing.	٥
agreed	٤	٠,٤٩	٣,٠٠	١١,٨	١٠	٧٦,٥	٦٥	١١,٨	١٠	٠	٠	The Management Center provides the appropriate environment for the application of cloud computing in the work environment	١
agreed	٥	٠,٥٨	٢,٩٢	١١,٨	١٠	٦٩,٤	٥٩	١٧,٦	١٥	١,٢	١	The information center administration provides the necessary training for the information center employees and the acquisition of skills in the field of cloud services.	٣
Agreed		٠,٤١	٣,٠	**General mean**									

		٤	

The previous table shows the following results:

- The members of the study from the employees of the Information Center of Information Technology in Saudi Airlines agree with all phrases of the axis (the extent of interest of the information center in the application of cloud computing in Saudi Airlines), whereas its arithmetic mean ranged between (2.92 to 3.18), which indicates the degree of (OK). These averages fall into the third category of the four-step scale; whose averages range from (2.51 to 3.25) which indicate a degree of approval of the study instrument.
- We also note that the general arithmetic mean for the study members' approval of the axis phrases was (3.04 out of 4), and a standard deviation (0.41), and the employees expressed their agreement with the phrase "the information center administration bears the risks of applying cloud computing in order to reap the desired benefits from computing cloud" first rank, with an average mean (3.18) and a standard deviation (0.52), where you find a sophisticated way to accomplish work tasks despite what may appear from negatives or risks to information security.
- In a related context, their agreement came second on the phrase "the existence of auxiliary systems for storing data, organizing and retrieving it on demand" with an arithmetic average (3.09) and a standard deviation (0.48), as that storage capacity is not specified, to absorb an infinite amount of data and information that can be retrieved anytime, anywhere. They also expressed their agreement with the phrase "the management of the information center to keep abreast of the technical developments related to cloud computing" at the third rank, with an average of (3.02) and a standard deviation (0.51), as the administration is keen to keep abreast of developments and localize them in this field to further facilitate work mechanisms. They also agreed with the phrase "the information center administration provides the appropriate environment for the application of cloud computing in the work environment" at the fourth rank, with an average score of (3.0) and a standard deviation (0.49), by updating the infrastructure, computer networks, the Internet, high speed, and technicians trained to work.
- Finally, their approval of the phrase "the information center administration provides the necessary training for the employees of the information center and the acquisition of skills in the cloud services" came at the fifth rank, with an average of (2.92) and a standard deviation (0.58), and this is achieved through their participation in courses with specialized bags to raise the level of their skills and abilities to work in a business-related cloud service environment.
- The previous results are consistent with the result of the [3] which concluded that the Palestinian telecommunications company is working to keep pace with the rapid technological developments, and with the result of the study of [9], which reached the direction of the majority of managers of the Deanship of Information Technology in Jeddah to use the technology of computing cloud, and also with the result of [18] that concluded that public and private sector organizations have a great knowledge of cloud computing technologies and capabilities, they are looking forward to working and disseminating this technology and using it and developing a proposal for adopting a cloud computing model to help public and private sector organizations to understand the capabilities required by cloud computing technologies for organizations.

b- <u>The second question: What is the role of cloud computing on the performance of employees of the Information Center of Saudi Airlines?</u>

To answer this question, Recurrences, percentages, arithmetic averages, standard deviations and ranks for the responses of the study members from the employees of the Information Technology Center of the Saudi Airlines were calculated on the axis of the role of cloud computing on the performance of the employees of the Information Center in Saudi Airlines, and the results were as follows:

Table 2. The responses of the study members from the employees of the Information Technology Department at the Saudi Airlines on axis phrases: (The role of cloud computing on the performance of employees of the information center in Saudi Airlines)

Degree of approval Agree %	Order Disagree **K**	Standard Deviation Strongly Disagree **K**	Average %	Degree of approval								Phrase	S
				Strongly agree		Agree		Disagree		Strongly Disagree			
				K	%	K	K	%	K	%	K		
agreed	١	٠,٤٥	٣,٢٢	٢٣,٥	٢٠	٧٥,٣	٦٤	١,٢	١	٠	٠	Cloud computing helps reduce routine workloads.	٥
agreed	٢	٠,٥٤	٣,٢١	٢٧,١	٢٣	٦٧,١	٥٧	٥,٩	٥	٠	٠	Cloud computing employees can exchange data and share it effectively	٣
agreed	٣	٠,٥٥	٣,٢٠	٢٥,٩	٢٢	٦٩,٤	٥٩	٣,٥	٣	١,٢	١	Cloud computing allows employees in the information center to work efficiently	١
agreed	٤	٠,٦١	٣,٢٠	٢٩,٤	٢٥	٦٢,٤	٥٣	٧,١	٦	١,٢	١	Enabling each member of the information center to access the information they need in a timely manner.	٤
agreed	٥	٠,٤٨	٣,١٩	٢٢,٤	١٩	٧٤,١	٦٣	٣,٥	٣	٠	٠	Increase employee knowledge of how to use the latest technology.	٦

Table 2. The responses of the study members from the employees of the Information Technology Department at the Saudi Airlines on axis phrases: (The role of cloud computing on the performance of employees of the information center in Saudi Airlines)

Degree of approval Agree %	Order Disagree **K**	Standard Deviation Strongly Disagree **K**	Average %	Degree of approval								Phrase	S
				Strongly agree		Agree		Disagree		Strongly Disagree			
				K	%	K	K	%	K	%	K		
agreed	٦	٠,٦٧	٣,٠٧	٢٣,٥	٢٠	٦٢,٤	٥٣	١١,٨	١٠	٢,٤	٢	Each department in the information center has a participatory electronic folder in the cloud computing that is coordinated according to specific regulations and updated periodically that helps to use the latest information.	٢
Agreed		٠,٤٣	٣,١٨	**General mean**									

The above table shows the following:

- The members of the study from the employees of the Information Center of Information Technology in Saudi Airlines agree with all statements of the axis (the role of cloud computing on the performance of the employees of the Information Center in Saudi Airlines), where their mean averages ranged between (3.07 to 3.22), which indicates the degree of (OK). These averages fall into the third category of the four-step scale, whose averages range from (2.51 to 3.25) which indicate a degree of approval of the study instrument.
- We also note that the general arithmetic mean for the study members' approval of the axis terms was (3.18 out of 4), and a standard deviation (0.43), and employees expressed their agreement to the phrase "cloud computing helps reduce routine job burdens" in the first rank, with an average (3.22) standard deviation (0.45), because it has the ability to accomplish many tasks and work tasks quickly and with great accuracy without going through the long and sometimes complex routine procedures. In a related context, their agreement came second on the phrase "employees in the cloud computing can exchange data and share it effectively" with an arithmetic average (3.21) and a standard deviation (0.54), because there is general communication between employees through networks,

regardless of the location, distances, departmental specialties, and nature, both of them worked. They also expressed their agreement with the phrase "cloud computing allows employees in the information center to work effectively" at the third rank, with an average of (3.20) and a standard deviation (0.55), because it facilitates a lot of manual and paper work tasks that afflict employees bored, exhaustion and errors.

- They also agreed with the phrase "enabling every member of the information center to access the information they needed at the appropriate time." Fourth rank, with an average arithmetic average (3.20) and a standard deviation (0.61), as all data and information are stored and there are continuous backup copies of them no matter how long or how long the work tasks are spaced. They also expressed their agreement with the phrase "increasing employees' knowledge of how to use the latest technologies" at the fifth rank, with an average (3.19) and a standard deviation (0.48), as frequent dealing with cloud computing mechanisms contributes to upgrading their skill levels, and informs them of the latest technologies every day and that to develop work during it.
- Finally, they agreed with the phrase "Every administration in the information center has an electronic participatory folder in the cloud computing that is coordinated according to specific regulations and updated periodically that helps to use the most recent information." At the sixth rank, with an average of (3.07) and a standard deviation (0.67), as this volume expresses the achievements of each administration and what has been achieved from the work tasks assigned to it, what are the problems facing the administration, and how to overcome them. The previous results are consistent with the result of the Al-Omari, Ayman's Study (2009), which found a relationship between the software requirements and the performance of employees in the company due to the appropriateness of the software used and its response to the user's needs, and with the result of the study [11] that concluded that cloud computing contributed to solving problems, the administration with high efficiency, and raising the efficiency of staff performance in the Ministry of Higher Education, which has a positive impact in developing their performance and accomplishing tasks with accuracy, speed and high efficiency. It also differs with the result of the study [4] that concluded that the reality of users' knowledge of cloud computing technology is less than expectations and aspirations.

c- The third question: What are the reasons that prompted the information center of Saudi Airlines to use cloud computing?

To answer this question, recurrences, percentages, arithmetic averages, standard deviations, and grades for the responses of the study members from the employees of the Information Technology Center of the Saudi Airlines were calculated on the axis of the reasons that prompted the Information Center of the Saudi Airlines to use the cloud computing, and the results were as follows:

Table 3. Responses of the study members from the employees of the Information Center Department of Information Technology in Saudi Airlines on the axis phrases (the reasons that prompted the Information Center of Saudi Airlines to use the cloud computing)

Degree of approval Agree %	Order Disagree K	Standard Deviation Strongly Disagree K	Average %	Degree of approval								Phrase	S
				Strongly agree		Agree		Disagree		Strongly Disagree			
				K	%	K	K	%	K	%	K		
Strongly agreed	١	٠,٥٢	٣,٤٦	٤٧,١	٤٠	٥١,٨	٤٤	١,٢	١	٠	٠	Fast access to the required data from anywhere and at any time	٤
Strongly agreed	٢	٠,٥٩	٣,٤٤	٤٧,١	٤٠	٥٠,٦	٤٣	١,٢	١	١,٢	١	Reducing the costs of periodic maintenance	٣
Strongly agreed	٣	٠,٦٢	٣,٤١	٤٥,٩	٣٩	٥١,٨	٤٤	٠	٠	٢,٤	٢	Reducing operating costs for conventional systems.	٢
Strongly agreed	٤	٠,٥٢	٣,٤٠	٤١,٢	٣٥	٥٧,٦	٤٩	١,٢	١	٠	٠	Contribute to the shift towards new ways of collecting and storing information	٥
Strongly agreed	٥	٠,٥٦	٣,٣٨	٤١,٢	٣٥	٥٥,٣	٤٧	٣,٥	٣	٠	٠	Provide high storage space without taking up physical space in the information center	١
Strongly agreed		٠,٤٥	٣,٤٢	**General mean**									

The above table shows the following:

- The study staff members of the Information Center Department of Information Technology in Saudi Airlines agree with all phrases of the axis (the reasons that prompted the Information Center of Saudi Airlines to use cloud computing), where their arithmetic mean ranged between (3.38 to 3.46) which indicates the degree of (strongly agree), Those averages fall into the fourth category of the four-step scale scale, whose averages range from (3.26 to 4) and that indicate a degree that is strongly agreed with the study tool.
- We also note that the general arithmetic mean for the study members' approval of the axis terms was (3.42 out of 4), and a standard deviation (0.45), and the employees expressed their strong approval of the phrase "the speed of access to the required data from anywhere and at any time." At the first rank, with an average mean (3.46) and a standard deviation (0.52), this provides everyone with access to data when moving to perform work tasks outside the work environment, or print copies of the official documents he/ she needs to facilitate his/ her work tasks ... etc. In a related context, their strong agreement came

second on the phrase "reducing periodic maintenance costs." With an average arithmetic average (3.44) and a standard deviation (0.59), as cloud computing does not stand on a sample computer in the work environment, but is related to networks as a whole and any device connected to the Internet can perform the task. They also expressed their strong agreement with the phrase "reducing the costs of operating burdens for traditional systems." At the third level, with an average (3.41) and a standard deviation (0.62), as it does not require specific hardware or specific programs, but relies on storing information and data through Internet and cloud computing services. Also, their strong agreement with the phrase "contributing to a shift towards new methods of collecting and storing information" came at the fourth rank, with an average of (3.40) and a standard deviation (0.52). Finally, they strongly agreed with the phrase "providing high storage space without taking physical space in the information center", fifth rank, with an average of (3.38) and a standard deviation (0.56), as there is no maximum limit for your information that can be stored, or saved through backups.

- The previous results are consistent with the result of study [3], which concluded that the material requirements for computerized management information systems are good, and with the result of the study [4] that reached the importance of using cloud computing technology in institutions and libraries and benefiting from their services and technologies, as well as with the result [6], which found the ease of using cloud computing technology and its availability anywhere and any time, and with the result of the study [10] that concluded that the use of cloud computing is characterized by the presence of a high degree of flexibility due to its ability to update, develop and access data easily. And to reduce the risk of losing it or losing digital content, and with the result of the study [11] concluded that cloud computing can be a solution to many of the technical problems facing the Deanship of Information Technology.

5. Conclusion

In conclusion, it can be said that cloud computing has greatly assisted in raising the level of efficiency, quality and access to information in the easiest way. Whereas, now, many government and private sectors have tended to apply cloud computing widely. It is a basic system for storing, managing, organizing data and files and sharing them via the Internet. Through what the researchers reviewed in this research from the reality of cloud computing in the information center of Saudi Airlines, it was found that the information center uses private cloud computing, and it also shares my computing services as a service and software service as well. The use of cloud computing helped employees access data and information very quickly and the ability to share data between them easily. This is one of the highest features that cloud computing provides its users. Despite the advantages offered by cloud computing, there are some challenges facing its users, the most prominent of which are the problem of internet outages and the problem of security and privacy protection. From what mentioned above, it can be said that the application of cloud computing is still few in Saudi Airlines and may be due to the novelty of this technology as it is not easy to move to the use of a new technology with no trained people are able to deal with these technologies. But, perhaps, in the near future the Saudi Airlines will get to provide all of its services through cloud computing technologies to interact with the future changes that the Kingdom's Vision (2030), which aims to digital transformation to localize modern technology and save time and effort for all governmental and private sectors.

The researchers provide a set of recommendations based on the results of the current

study, including:

- The information center should expand the use of cloud computing applications to take advantage of its advantages in all the departments of the center.
- Holding development training courses and workshops for employees on using cloud computing applications to increase their performance improvement to develop their skills.
- The information center of Saudi Airlines should retire with Saudi companies that provide cloud services by providing cloud services and high-quality infrastructure. This will make a quantum leap in facilitating business procedures, as it will be a major tributary in developing the work environment, in providing expenses, space and providing new services.
- The importance of developing and adding an excellent and robust network infrastructure for cloud computing to overcome the problem of connection loss, you do not have any data to work on.
- The importance of giving adequate guarantees to notify users of security about privacy on their data in a cloud computing environment.
- The importance of setting mechanisms at high levels to eliminate security concerns with the application of cloud computing on Saudi Airlines.
- The need to develop cloud computing to achieve a high degree of confidentiality in organizations' data.
- The importance of increasing the levels and elements of complete information security of the data raised on the cloud.
- The need to take preventive measures through cloud computing in order to protect data from cyber criminals and hackers.
- Building a collaborative partnership with the Saudi cloud computing community that focuses on adopting cloud computing services in the Kingdom, increasing knowledge awareness in the field of cloud computing, and contributing to achieving the (2030) Vision by supporting the knowledge and participatory economy.

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