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Original Research Article

Developing a document management system in cloud environment using Microsoft Office365 capabilities

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ABSTRACT

The significant advancements that accompanied the era of technological advancement and the extraordinary circumstances that have emerged in recent years have prompted institutions to seek technical solutions to conduct their business and keep up with the challenges of this era. Consequently, this study aims to develop a document management system for a cloud environment utilizing the capabilities of Microsoft Office 365 through an applied study in the Department of Library Science at Al-Hussein Bin Talal University, using the applied approach as the most suitable method to achieve the study's objectives. Using the capabilities of Microsoft Office 365 applications, this study developed a program for managing electronic documents. The study determined that the document management system utilized by the Library Science Department in the College of Arts at Al-Hussein Bin Talal University must be enhanced. It was also determined that the proposed system for managing electronic documents in the department using the features of Microsoft Office 365 is a highly effective, cost-free alternative to the existing system. The study emphasizes the significance of implementing this system in the Department of Library Science in the College of Arts at Al-Hussein Bin Talal University before expanding it to all other departments.

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1. Introduction

Institutions engaged in various types of activities, whether commercial, industrial, or academic, devote a significant portion of their efforts to preserving documents so that others can access and benefit from the information immediately or in the future. This significance stems from the requirement to access the stored information throughout the life cycle of any information management system in order to utilize or modify the information by those working on the system.¹ When examining the different categories of administrative documents, it is possible to find written, drawn, and printed documents. These documents were generated during the practice of administrative work within the institution and are stored

for varying lengths of time to facilitate retrieval.² The level of importance and confidentiality of these documents varies from one to the next. The increased need to retain and retrieve documents has led to the development of numerous document management systems. Some of these systems have been tailor-made to accommodate the nature of the work in particular institutions, but they are not suitable for use in other institutions.³ Some of these systems are designed for larger organizations with similar work characteristics. Additionally, some of these systems were created and made available for free use, while others are available for purchase.⁴ This variety offers institutions a variety of options with multiple features that correspond to the budgets of various categories of institutions.

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1.1. Problem of the study

Document preservation consists of a series of technical operations executed in the shortest amount of time and with the least amount of effort. This includes categorization, analysis, storage, and retrieval.⁵ This research appears to be addressing the lack of a computerized system to store and manage documents in the Library Science Department (LSD) at Al-Hussein Bin Talal University's Faculty of Arts. This makes it difficult to locate any document, in addition to the time required to find it due to the sheer volume of documents. Notable is the fact that the LSD was established in 2007. In addition, the emergence of the Corona pandemic reduced the number of employees during office hours, necessitating the continuation of remote work. This caused a problem with the document storage and retrieval process. Currently, these documents are manually stored within files on the shelves and manually retrieved by referencing the inbound and outgoing records files to determine their location within these files. To store or retrieve any document requires a significant amount of time and effort, as well as an expanding storage space within the department office.

2. Questions of the study and Methodology

This study is conducted to answer the following questions:

1. How feasible is it to construct a cloud-based document management system for the LSD at Al-Hussein Bin Talal University using Office365 applications that can be accessed from anywhere?
2. What are the development steps and what are the ways to customize and activate the various features in the application?
3. What are the features and limitations of applying this system on document management process in the department?

Utilizing the capabilities of Microsoft Office 365 applications, the LSD department at Al Hussein Bin Talal University uses the method of applied scientific research to create a document management system in the cloud.

The article examined the topic's theoretical aspects in order to gain a comprehensive understanding of it and to collect information about the experiences of others in this field. Moreover, the registration phase consisted primarily of the following steps:

1. Creating a Microsoft Office 365's account through the computer center of the university.
2. Logging to the SharePoint application and creating a website for the library science department.
3. Connecting SharePoint app to OneDrive.
4. Settings of LSD documents were uploaded to the SharePoint app through the OneDrive app.

5. Utilizing the capabilities of Microsoft Office 365 applications, the LSD department at Al Hussein Bin Talal University uses the method of applied scientific research to create a document management system in the cloud.
6. The article examined the topic's theoretical aspects in order to gain a comprehensive understanding of it and to collect information about the experiences of others in this field.
7. Retrieving documents by searching

3. Literature Review

Hung.⁶ investigated the fundamental requirements for constructing an electronic document management system that offers a unique environment for any administrative or academic system. In addition, they developed a small document management system for a private cloud environment using an application they created to carry out the document management system's fundamental operations and conducted a case study of its application in some Chinese schools and government institutions. The study concluded that pupils and employees have a strong desire to utilize these systems because they provide access to documents at any time and from any location. Atalay⁷ analyzed the impact of SharePoint applications from Microsoft Office 2010 on academic information administration in a selection of Cypriot universities. The purpose of the study was to determine the extent of the impact of using this software to manage the flow of academic information at the university on various groups, including students of varying ages and instructors of varying ranks. The study concluded that the use of this software for storing and managing information has a positive impact on the speed and effectiveness of academic operations between diverse groups. Aloklu,⁸ conducted a qualitative descriptive case study to investigate how digital archiving and document management are structured at Taibah University in Saudi Arabia to meet the needs of researchers, professors, administrators, and students, as well as to ensure secure data storage and access. In addition to interpreting the data by reference to the previous formula, he conducted in-depth analyses of the management strategy and data archiving in the chosen institution, as the proposals indicated that Taibah University follows a specific strategy for managing electronic documents but does not use a unique system for managing data.

Khair's⁹ study aimed to identify the requirements for the success of the electronic document management system in the General Authority for Insurance and Pensions, in addition to identifying the reality of the current document management system in the General Authority for Insurance and Pensions. The study population consists of employees of the General Authority for Insurance and Pensions in the Gaza Strip in the Palestinian Territories. The study

concluded that there is knowledge of the requirements of the electronic document management system by the General Authority for Insurance and Pensions and the existence of a conviction among employees that the electronic system is characterized by speed, accuracy, and transparency and will reduce the rate of file corruption, reduce the loss of documents between departments, and clarify the path of their flow. The study reached a number of recommendations, the most important of which are: increasing attention and awareness of the necessity of applying policies, mechanisms, and procedures to ensure the success of the electronic document management system; the need for the Authority to define its strategic and interim goals to achieve them in an accurate and thoughtful manner; and to begin operating the training center in the Authority and develop appropriate training plans for all employees.

Ahmed's¹⁰ study aimed to introduce explore electronic document management systems, their functions, and their importance in relation to processing electronic files and documents. It also dealt with a presentation of the most important international standards related to their establishment and implementation, addressed the definition of the electronic document management system of the Ministry of National Education, the responsibilities of working through it, its importance for the sector, and dealt with the evaluation of this system. Through an evaluation guide derived from the most important international standards related to electronic document management. The study concluded that this system is consistent with the recommendations of international standards by responding to various items related to the creation, processing, preservation, availability, evaluation, and exclusion of documents.

3.1. Justifications for creating an application for managing documents in the LSD at the College of Arts at Al-Hussein Bin Talal University.

Among the most important justifications for creating an application for document management in the LSD at the College of Arts at Al-Hussein Bin Talal University are:

1. The absence of an electronic application for document management in the department
2. Difficulties in storing and retrieving documents through manual methods
3. The need for large storage spaces to keep documents for several years
4. High consumption of paper and inks for printing hard copies of documents

3.2. Building a document management system in the LSD at Al-Hussein Bin Talal University

To build a document management system by using the capabilities of Microsoft Office 365, we followed the

following steps:

First: Obtaining a Microsoft account that supports the use of OneDrive and SharePoint applications, in addition to Office applications. To implement this step, the university's computer center was contacted, and an account named LibraryScienceDMS@ahu.edu.jo was created under the terms of the agreement signed between Microsoft and Jordanian universities.

Second: went to www.office.com and logged in using the username and password that was provided by the computer center at the university, as shown in the Figure 1.

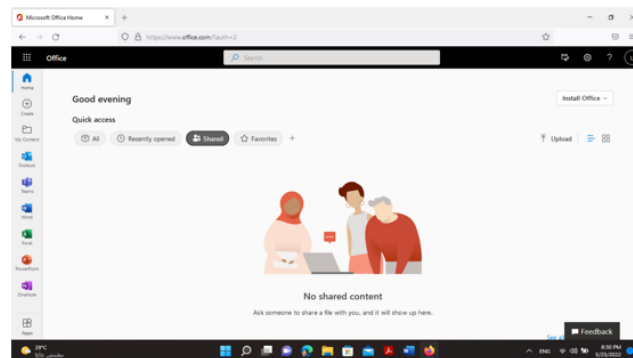


Figure 1: www.Office.com website

Third: Go to the dots sign at the top of the screen on the left side, next to the word (Office), and choose the SharePoint icon. This option takes us to the page for this application under the same original account name.

Fourth: A website for the LSD was created through the SharePoint application, according to the following steps:

1. Choose (Create Site at the top left of the screen
2. Choose Team Site, and this option is to create a site for tracking and sharing documents within a group of people.
3. Fill in the form with the required data, which represents the identity of the site to be created, and then choose Next.
4. On this page, you can add all the accounts of the people you want to add within this site from the section and then choose finish, noting the possibilities of modification to them by adding or deleting them later, as in Figures 2 and 3.
5. On the next page, you can choose a general design for the site from among the many designs available by Microsoft. This page can be ignored by selecting Maybe Later. After the end of this stage, the construction of the required site will be completed.

Fifth: Creating a folder within the site to contain the department's documents in the following manner:

1- Choose (Document) from the options on the left of the page, then folders can be included, and documents

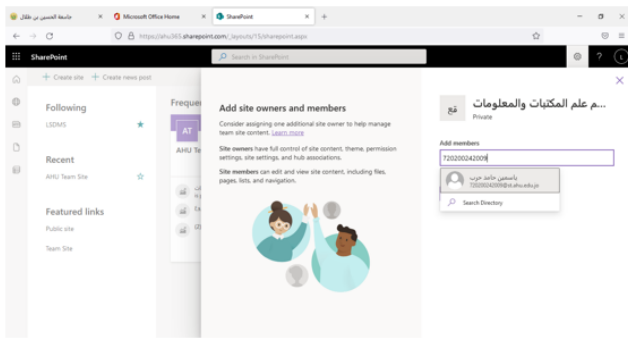


Figure 2: Adding an account to the library science department website.

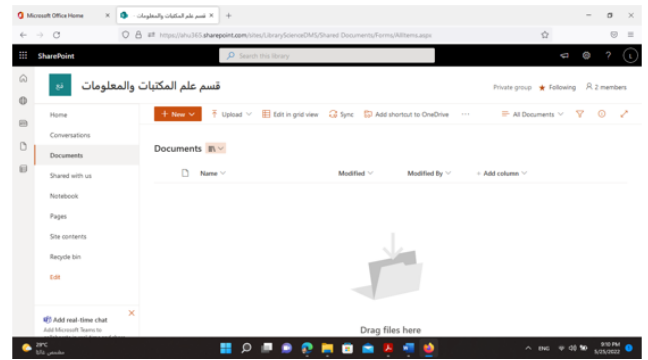


Figure 4: Entering to the document folder within the library science department website.

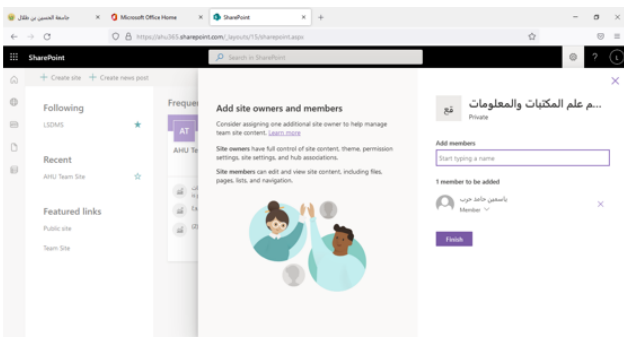


Figure 3: Adding an account to the library science department website.

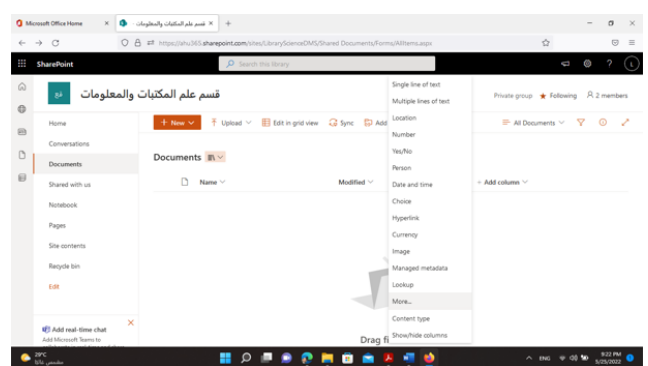


Figure 5: Option to add a new metadata column.

can be added to them directly. However, to customize the site in line with the requirements of the LSD at the university in relation to its incoming and outgoing records, an additional step must be taken before creating the actual folder, which is the inclusion of additional columns to specify the descriptive data of the document (with the possibility of performing this step later). Note that the site automatically inserts three descriptive data, which are: the name, the date of modification of the document (Modified), and the name of the account that modified it (Modified By), as in Figure 4.

2- Go to (Add Column) on the right of the screen and choose (More) as in Figure 5.

3- Here, multiple types of metadata can be added by writing the title of the data and specifying its type, in addition to any other information such as the number of characters, as in the figure. Since the metadata to be added is text data that represents the data headings in the incoming and outgoing records in the section, and for ease of application, the type (Single Line of text) is chosen, apart from dates, so Date and Time are used without the need to add any other things. After completing the column title and type, click the (OK) button at the bottom of the page. This process is repeated for each column that represents the metadata of the documents within the system.

4- Creating folders to contain documents, which are represented by a folder for (Out Documents) and a folder for incoming documents (IN Documents) to be compatible with the official incoming and outgoing records, in the following manner:

- Choose (New) from the top of the page and choose (Folder).
- Write the name of the folder, in this case (Out Documents), and then press (Create) button. Repeat this process for the other folder called Induments.

At this stage, the document management system for the LSD at the College of Arts at Al-Hussein Bin Talal University has been established. The next stage is to clarify how to deal with this system for storing and managing documents.

4. Method of Document Management in the Proposed System

The management of electronic documents is represented in several main matters that are implemented on the electronic document and ensure its availability during its life cycle, and among the most important of these matters, which were previously detailed, are the following:

1. Create the document

2. Transfers
3. Version control
4. Workflow
5. Search and retrieve

To determine the availability of these matters within the proposed system, the researcher took the following steps:

First: Preparing a suitable environment for document management operations:

To manage documents within the system that has been established, there are several methods available, and the researcher was keen to choose the easiest method in application while ensuring its efficiency in the operation of storing, managing, and retrieving. This method requires the presence of another Microsoft Office 365 application, which is the OneDrive application, and this application is available implicitly in the university agreement with Microsoft and with a default storage space for the average user of 5 Terabytes (TB), noting that this space can be increased through the system administrator in the computer center. To setup OneDrive, the following steps were conducted:

Step one: Link the One Drive app with the SharePoint app From the (SharePoint) application, select (Add Shortcut To OneDrive), as shown in the Figure 6.

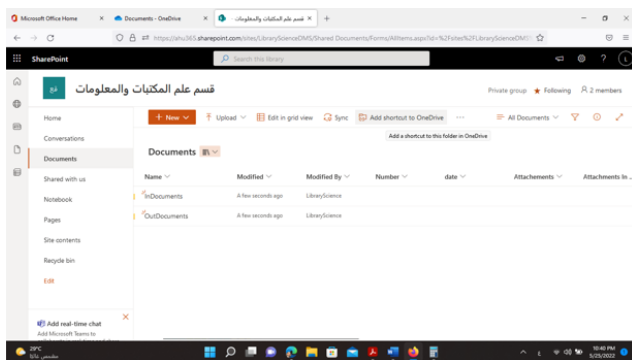


Figure 6: Linking the SharePoint application with the OneDrive application.

- After the previous step, a folder link is automatically created within the (OneDrive) application called (Documents) including In and Out folders.

Step Two: Install the OneDrive application on the computer, knowing that this application is automatically available within the Windows10 and Windows11 applications, with the ability to download it from the Microsoft website for other operating systems, and then press the (Sign In).

Step Three: entering the (OneDrive) application inside the device using the account that was used previously, and at this stage the process of linking the personal device to the (OneDrive) application, and thus implicitly linking it to the contents of the (SharePoint) application.

At this point, a link to the main folder of the OneDrive application was automatically created on the device.

Second: Executing and examining the effectiveness of the process of creating the document in the system.

To carry out this process, we need a scanner to take an electronic copy of paper documents, in addition to a text-editing program to create electronic textual documents and modify them. Three steps were applied as the following:

For the first step, a Samsung SCX scanner has been connected, which provides the possibility of automatic paper feeding, so the document can be downloaded easily at once for the document that contains more than one sheet of paper. The settings of the scanned documents shown in Figure 7 to produce PDF files (i.e., digital files).

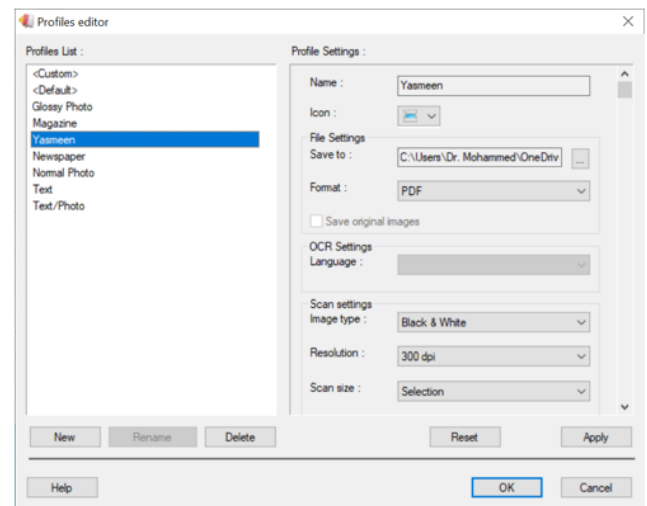


Figure 7: Scanner settings

- The file was automatically uploaded to the (OneDrive) application and implicitly to the (SharePoint) application the instant the device connected to the Internet.

For the second step, the document was created and saved to shared folder/s using Microsoft Word application, which is available within the account given by the computer center. Moreover, the moment the device connects to the Internet, the file is automatically uploaded to the OneDrive application and implicitly to the SharePoint application.

For the third step, the document was created from another device that does not have a OneDrive link inside it. A smart phone was used to upload a document to the site directly through the SharePoint application, which can be easily installed on the phone for free. This shows the possibility of using the system from both a computer and a mobile phone. See Figure 8).

The previous examples show the effectiveness of the system in the process of creating documents in more than one way, where the first example showed the possibility of creating a document by converting paper documents into electronic documents using a scanner. Also, the second

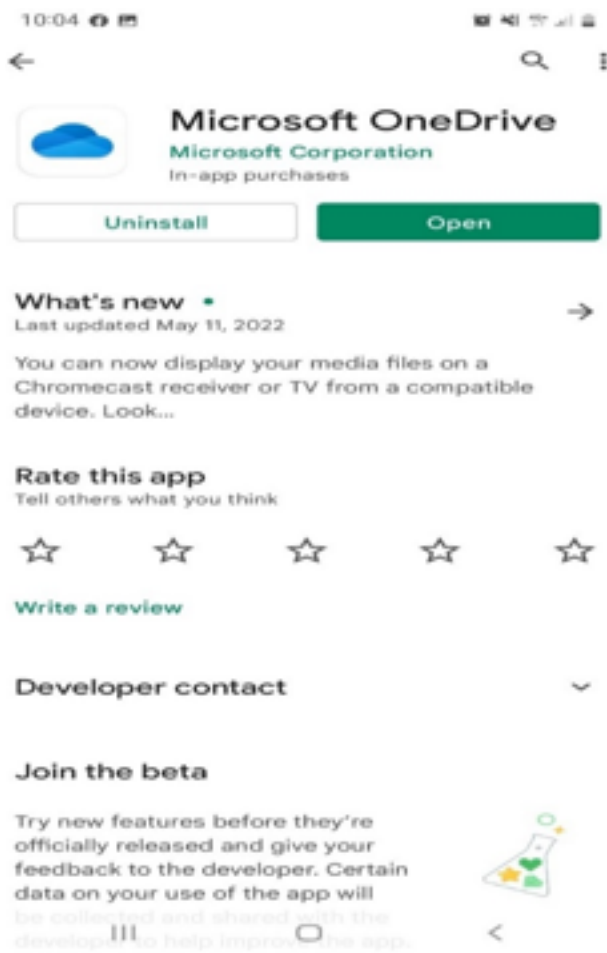


Figure 8: OneDrive mobile app installation.

example showed that the electronic document can be created through some computer applications such as the (Microsoft Word) application, and the examples showed the effectiveness of the system's dealing with these types in terms of creating and storing them on the system. The third example also showed the possibility of dealing with the system through the mobile phone easily and effectively.

To prove the effectiveness of the system in the process of storing documents, 137 paper documents, located in the LSD at the College of Arts at Al-Hussein Bin Talal University, were scanned, and classified into three folders: the faculty folder, circulars folder, and master's degree \ outgoing \ incoming. These documents were later classified on the website of the LSD into two main categories: (IN Documents) for documents received by the department (with a total of 111 documents), and (Out Documents) for documents issued by the department (with a total of 26 documents).

4.1. Third: transfers

It is the ability to convert files of certain types that are read by certain applications to files of other types that are read by other applications.

Microsoft Word application was used to convert Docx file type (Microsoft Word Document) into PDF type following easy steps shown in Figure 10.

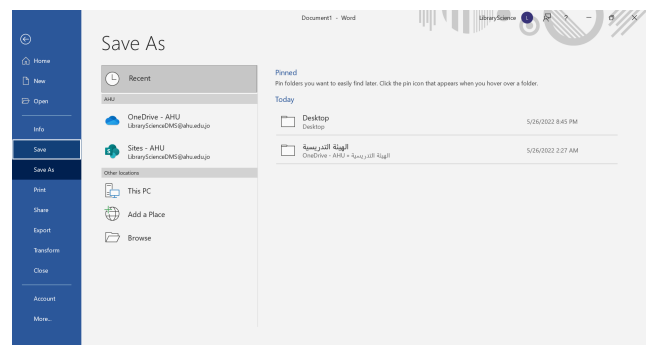


Figure 10: Saving a Microsoft Word Document.

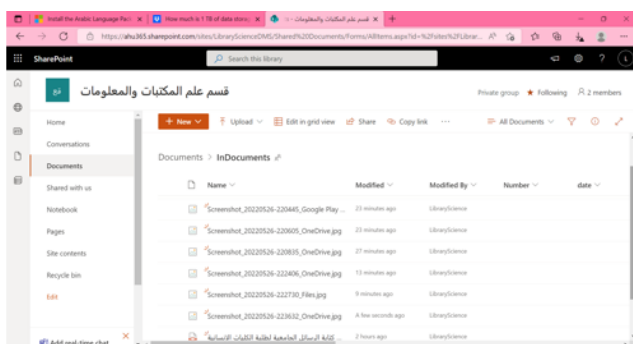


Figure 9: The document appears automatically on the website of the Library Science Department.

4.2. Fourth: Version control

Is the process that gives the ability to control the tracking and management of different versions of the same document that relate to the same information.

The (SharePoint) application gives great capabilities in terms of tracking the change that can be made to the document by more than one person or by the same person by marking it with different version's numbers that are created during the change to the document, reloading it, or entering it, indicating the name of the user who performed this the operation.

4.3. Fifth: workflow

Is the process of sending a document to the appropriate authorities for review or comments, before sending it on to other parties or returning it to the source. This operation can be performed manually or automatically within the SharePoint application. The manual method involves selecting the file from the relevant account and then sharing it with one or more other accounts while indicating the required action. As for the automatic method, restrictions and limitations are established within the system settings for the process of automatically converting documents, based on the authority that created the document and its classification. Because the second method required the system administrator and a specialist to configure the system with the laws and procedures essential for automatic document orientation, the first method was utilized.

The SharePoint application is control the workflow of documents in the system and transfer them from one side to another, with the possibility of direct access to all these changes and responses from other users.

4.4. Sixth: search and retrieval

Determines the items a user can search for and how to reach them within the system.

This procedure describes how to search for and retrieve documents, along with the necessary criteria for these operations. To implement this procedure, columns of metadata that correspond to those in the section's incoming and departing records were created. These columns determine the available search options for locating a specific document within the system. This metadata includes the identity of the user who uploaded the document to the system, the date of the upload, and the name of the document. Notably, SharePoint provides a search engine that can autonomously search for a document's name or a portion of its name, as well as a word or phrase within the document's textual content. For optimal search results, it is preferable that the content of documents be textual, regardless of the file format employed. Due to the high cost of scanners with this capability, known as OCR (Optical Character Recognition), the scanner in use cannot copy Arabic-language documents as text. To demonstrate the effectiveness of the system for any textual content, two types of text files were utilized: Microsoft Word Document (Docx) and Adobe Acrobat Reader (PDF) files with textual content, as well as image content stored within PDF files and the result of scanning a set of documents in LSD.

Another method for retrieving data is through search. With this method, it is possible to search for any document within the system folders in general way or in a custom way through: Search for a document by its name or type, its content (here it is required that the content be textual), metadata (not available in the current account and can be

activated through the system administrator).

4.5. Seventh: The cloud environment

Is the process by which an external storage space is provided to users without the need for internal servers to contain that space and without the need to be concerned with the maintenance process or the permanence of Internet access to this storage space.

From the preceding examples, it is apparent that the proposed application implements the direct storage process through the device to the OneDrive application folder link, which automatically displays items stored in the SharePoint application on Microsoft servers with the ability to store them on the device and synchronize them with what is stored on Microsoft servers for the user account. This allows access to these stored documents at any time without an internet connection. On the other hand, it is possible to access these documents stored in the cloud environment from anywhere and at any time, so long as there is an Internet connection and permission is granted by the entity that created the documents.

5. Findings

1. The LSD at the College of Arts at Al-Hussein Bin Talal University must develop and computerize its document management system for the following reasons:
 - Difficulty manually storing and retrieving documents
 - The amount of storage space required to store paper documents is enormous and growing over time.
 - Insufficient personnel in the department to monitor document management.
2. There are no additional costs associated with the university's use of Microsoft Office 365 applications, which are classified as commercial systems, because an agreement grants the university the right to use the vast majority of these applications at no cost.
3. The simplicity of creating a system for managing electronic documents in LSD at the College of Arts at Al-Hussein Bin Talal University using Microsoft Office 365 applications, and the possibility of distributing it to the remainder of the university's departments, deanships, and departments.
4. The efficiency of the system, which is constructed using the SharePoint application and the OneDrive application, is accomplished by implementing all of the essential operations that must be present in an electronic document management system.
5. This system is a revolutionary solution to the problem of implementing electronic document management processes in terms of storage, tracking, and retrieval.

6. Source of Funding

None.

7. Conflict of Interest


None.

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