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Web-Based System for Archiving Activities of University College Staff

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***Abstract* - The electronic archiving of employee activities is becoming more and more crucial for organizations of all kinds in the current digital era. Organizations can ensure accurate documentation of work activities, facilitate performance reviews, identify areas for improvement, and ensure compliance with internal policies and external regulations by keeping a systematic record of each employee's actions and accomplishments. The activities of employees are of great importance in raising the scientific and societal level of institutions and universities because of their role in educating and spreading the spirit of participation, creativity and development, each in his field and specialization, in addition to being a major element in evaluating the employee's job performance and his eligibility for promotion. In this paper, we propose to create a web-based system to collect and archive the activities of employees and workers in an Iraqi university, based on frontend and backend technology, and using the Node.js framework, with different powers starting from the admin and ending with the employee, through the dean of the college and the head of the department. The benefit of the proposed system lies in getting rid of the manual search and archiving process and replacing it with a simple and fast electronic system that can be relied upon, referred to, and benefited from the results it shows. It can be accessed from anywhere in the world where internet service is available.**

Keywords: Archiving, Employee activities, Nodejs, Frontend, Backend.

I. INTRODUCTION

In contemporary organizations, the electronic archiving of employee activities is becoming more crucial. These archives serve as official records for all types of workplace activities, including communication and performance metrics, as more and more work is done online. Furthermore, organizations can use data analysis tools to learn important things about workplace efficiency and trends thanks to the numerical accuracy of electronic archives. The compatibility of these archives with almost every system is crucial because these archives frequently contain interactions with employees and the relationships between their systems. Web-based archiving systems have been used in a variety of areas, including education, as a result of technological advancements and the widespread availability of the Internet. Web-based systems are used in colleges and universities to handle a variety of tasks, including archiving the work of particular employees. This paper deals with design and implement of a web-based archiving system of the activities of a college employees using the nodejs framework based on frontend and backend technologies.

II. WEB-BASED ARCHIVING SYSTEM

A) Document Archiving

An archive is a location where items are kept for a very long time. They are kept around in case someone ever needs or want them. Additionally, they are maintained in a way that will allow for future use [1]. Automation facilitates the creation and storage of electronic copies of artefacts as well as the development of practical methods for the scholar to organize them, as demonstrated by empirical research. In the presence of an electronic archive, what was previously accomplished by years of painstaking effort in "paper-based" archives is completed in weeks and days. The structuring of documents, which involves building a database of related data, is the most important aspect of the information system [2]. Document creation, distribution, duplication, and preservation are significant issues. The majority of organizations and universities either manually or semi-automatically undertake this activity. In reality, though, it has a lot of issues because there is no efficient document management system. Finding important documents quickly when needed and sharing such documents with others when necessary are challenging tasks [3]. The ability to utilize archives without leaving the workstation, quick search, flexible and easy indexing, full-text search, reduced likelihood of file loss, space savings, and risk reduction are only a few benefits of electronic records management. Because it is stored digitally, archive damage is reduced, security is increased, and data recovery is simple [4]. The College of Computer Sciences and Mathematics' work on electronic archives aims to develop technologies and methods for electronic archiving and to compile information on staff

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activity. Studying the potential for the integration and interoperability of different electronic archives, as well as the modernization of platform and software solutions for them, is another goal of the research described in this article.

In order to extract more values from the information they hold, universities are increasingly turning to archival data for employee annual evaluations. This is especially true as sophisticated data analysis and modeling tools become more commonly used in large enterprises. For instance, universities want to be able to blend historical data with current data to gain insights on how to enhance staff productivity, simulate potential new business models, or boost operational effectiveness.

B) Node.js

Node.js is an open-source, cross-platform JavaScript runtime environment that enables developers to create server-side applications with JavaScript. Node.js offers a wide range of system-level APIs, including those for file operations, web programming, and other tasks, and utilizes the Google Chrome V8 engine for fast performance [5]. Based on the JavaScript engine seen in Chrome V8, Node.JS is a development platform [6]. Node.JS has developed a much more potent and extensive functional ecology on this platform thanks to Node Package Manager (NPM), the open-source community, and other routes of functional expansion. The Node.JS functional modules needed for integration can be found via the NPM [7].

Node.js has established itself as the backend environment of choice for many businesses since it is both quick and lightweight. For instance, LinkedIn migrated from Ruby on Rails to Node.js in 2012, and testing scenarios showed a 20x improvement in performance [8].

More than one advantage that Node.js have including (low learning curve requirements, scalability, high performance, accelerated web application development, decreases loading time using rapid caching, faster response times for apps, and community assistance) [9].

C) Frontend Technology

Millions of people use websites every day to obtain various types of information as well as to learn, play, shop, share experiences, and travel. Numerous websites compete to be the best and attract users at the same time, numbering in the millions [10]. Developers refer to the portion of a website or application that users can view and interact with when they use the term "frontend" of a website or application. The frontend of a website consists of the content as well as its design, organization, and layout. A user-friendly (UX) frontend design is crucial because when a new visitor clicks on a website or app, the frontend is the first impression of a business or brand. In order to design and develop such frontend web interface, certain tools and technologies are to be used, which are usually a combination of HTML, CSS, and JavaScript all being controlled by the browser [11].

Since design and frontend programming go hand in hand with the creation of websites and mobile applications, it would be foolish to discuss one without the other. Web designers and those with UI/UX expertise are among the many hats that many frontend developers wear. A designer can create more user-friendly, interactive UIs if they are aware of the kinds of things that can be done with frontend coding, and vice versa.

D) Backend Technology

The back end of a website or application is everything that the user cannot see and is behind the scenes, whereas the frontend is the appearance and feel of the website. In order to fulfill user requests, the back end gathers data from external servers and apps and filters it before returning it to the website. For instance, if you're booking a flight and submit your information on the website, it will be processed to book your flights and kept in a database built on a server. These several phases make up backend development.

The technologies that support these database transactions and user requests are created by backend engineers. Their function is crucial. To ensure the quick and effective operation of a website or application, they implement and oversee all of the backend development's technical details.

Building the software, also referred to as the backend, involves using a range of programming languages and frameworks. Frameworks are pre-written code libraries with pre-imposed structures that a backend developer can utilize in accordance with the demands and requirements. Scripting languages like Ruby, Java, Python, PHP, Perl, Erlang, and Node. JS, which can be used to provide instructions for execution, is a subset of programming languages.

Currently, it is highly straightforward to construct an app if there is a backend service that can be interfaced with their apps across all platforms. The biggest challenge for the developers, however, is choosing or creating a flexible, high-concurrency backend for their application. [12].

III. RESEARCH METHODOLOGY

A descriptive qualitative analysis research method will be used for building the proposed system. Making a systematic, factual, and accurate account of the facts, qualities, and relationships between the phenomena under study is the goal of descriptive-analytical research.

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A) Analysis of the Current System

To better understand information system issues, problems are divided into smaller, more manageable components through the process of systems analysis. The end result of system analysis is a method for resolving issues with the new system specifications. To prevent mistakes from occurring in the next stage, which is the design of a new system, an analytical approach is required in the analysis phase. The strategy used is outlining the issue with the current system and, at the same time, reviewing each way the system functions in accordance with guidelines established by the Human Resources department because this step is so crucial. So that the issue will be understood, along with the challenges the system is currently experiencing and the effects, it should be regarded as a validation of the intended system that was designed prior to repair.

B) Analysis of System Requirement

The prototyping process is used to analyze the needs of this system. By implementing UCD (user-centered design), the analysis of e-archive system needs is represented using the prototype method. The flowchart that follows:

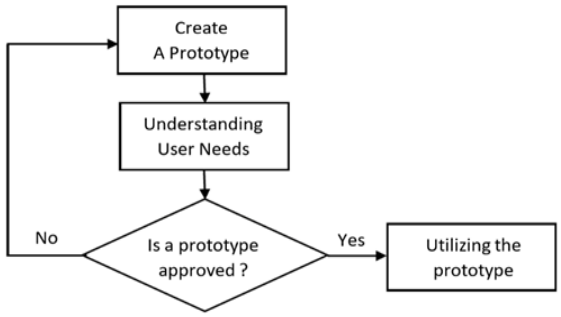

Figure 1: UCD Flowchart

The UCD prototype technique has stages that must be completed, including:

a) Recognize user needs.
b) Describe the needs of the user.
c) As an alternative, create a prototype.
d) Reviewing the plan.

C) Problem analysis

Interviews with the storage operator and the document user were undertaken to ascertain the demands of the users. The results revealed the following primary issues:

a) Saving documents requires a lot of time.
b) Access to archival records still heavily depends on the efforts of a single person.
c) The risks of corruption of the files those are stored.
d) It takes a long time to find documents.

The user's difficulties can be inferred from the problems listed above, and it can be deduced that the following keywords can satisfy the user's needs: An application that works rapidly, can store and manage documents safely, and can search documents quickly.

IV. PRPOSED SYSTEM

The proposed system includes a solution to the problems mentioned later and meets the requirements of users in all their scientific positions, from the dean and the head of the department to the employee with the activity, where the Nodejs framework will be used with the capabilities provided by the JavaScript language, in addition to that we will have a work environment consisting of Server and Client, As well as using the highly popular MySQL database, continuous support, and flexibility to add and modify as shown in fig.2. We will have four levels of users in the system:

1) Administrator: He is responsible for all operations of adding, updating, deleting, searching and maintaining on the system.
2) The Dean: He is the person who has the right to view and search only for all the activities of the employees in all departments, and he is not able to perform the operations that the director carries out, including adding, deleting, or modifying, except after addressing him by an official mail from within the system to implement the required order.
3) Head of Department: He is the person who can search and view all the activities of his department exclusively, to the exclusion of other departments.
4) The Employee User: He is the person who can search and view all his activities exclusively and he cannot change or update anything on his activities except through the admin.

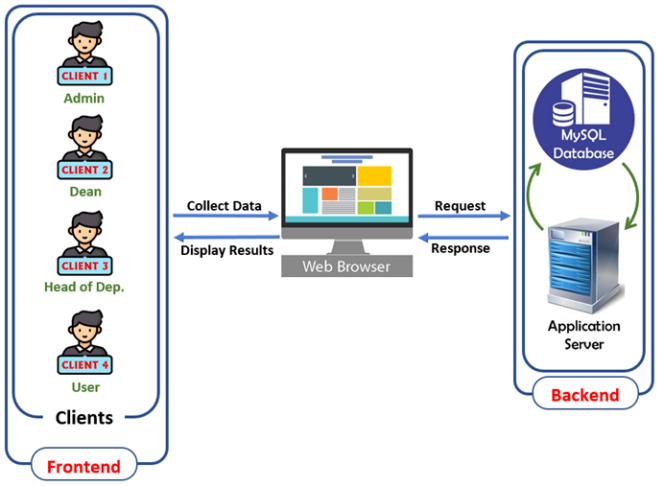

Figure 2: The Proposed System

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The admin will collect the basic information of the college staff to create an account for each one. This information includes (department, name, e-mail, mobile number, user type (dean - department head - user)). The next step is to collect employee activities and enter them into the system. Each activity will contain the following information:

1) Type of activity.
2) The title of the activity.
3) The date of the administrative order related to the activity.
4) The period of activity.
5) The department(s) involved in the activity.
6) The names of the participant(s) in the activity.
7) An overview and additional information about the activity.
8) Links posted on the internet related to the activity.
9) Attachments (image/PDF file).
10) The barcode of the activity (if it exists, it will be scanned with the barcode device or entered manually, and in the absence of it, the system will add a barcode for that activity, and it can be attached later to the book after reprinting it).
11) Type of activity (internal/external).

After entering the activity data and giving the order to upload it to the server, an e-mail will be sent to all participants containing a notice of adding that activity, its address, the date of the order issued in this regard, and its barcode so that the employee can refer to it in the future if needed.

V. CONCLUSION

There has been a great need over the years for the archiving of staff activities for Iraqi universities in general to be electronic in order to be able to facilitate the recovery of information on those activities, reduce paper costs, increase search speed, accuracy of results, and save them in the long term from damage and loss. There has also been an increase in the need for freedom of information and transparency in the presentation of such data. The employee activities archiving system will follow up the attendance and participation of employees in the activities held by the university and the reports needed by the e-government in the presidency of the university. In the proposed system, there is an integration of data from several aspects related to the date of the administrative order related to the activity, the date of the start and end of the activity, a brief summary of it and the associates participating in it, which will enable the department head and the dean of the college to track employee promotions based on several points, one of which is the number of activities they have carried out. The proposed system has been built using the frontend and the backend, using the Node.js work environment, which is one of the frameworks based mainly on the JavaScript language, as it is the most powerful environment in performance and the fastest in searching when combined with the MySQL database, which in turn We will have a robust and fast system with strong security that is difficult to hack.

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