Facial Emotion Detection and Recognition

Information Technology and Artificial Intelligence

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CHAPTER 2: Related works.

Chapter 2: Related Work

2.1 Introduction

Automation, driven by technological advancements, has transformed industries by improving efficiency, accuracy, and productivity while reducing costs, errors, and risks. It also enables humans to focus on more complex and creative tasks. In higher education, where meticulous organization and management are essential, automation holds promise. However, implementing automation in education requires a careful and nuanced approach. It must consider the unique dynamics of educational institutions and involve collaboration from stakeholders such as faculty, staff, students, and administrators. This ensures that automated systems align with institutional goals and address diverse needs and challenges. The outlined project aims to automate departmental processes under the guidance of the department head. It consists of purpose-built modules tailored to the department's requirements and aligned with institutional objectives. These modules enhance departmental quality, performance, and communication. By streamlining operations and optimizing resource utilization, the project improves the department's ability to fulfill its mission. Each module serves a specific function, streamlining administrative tasks and facilitating academic planning and evaluation. They enhance efficiency and effectiveness across departmental operations. Moreover, by promoting communication and collaboration, the project fosters a culture of innovation and continuous improvement. The project emphasizes strategic design, meticulous implementation, and ongoing evaluation. It prioritizes user-friendliness and accessibility, ensuring that all department members can effectively use the automated systems. This approach ensures the project's long-term viability and success in driving positive change within the department. In conclusion, the project proactively responds to the evolving landscape of higher education by leveraging automation to enhance departmental efficiency, effectiveness, and communication. Through technology and collaboration, the project empowers the department to thrive in a complex and dynamic educational environment.

2.2 Literal Review

2.2.1 Improving Process Efficiency in Iraqi Universities [1]

2.2.1.1 Introduction

Managing universities is a difficult and demanding job that calls for the integration of several systems and procedures as well as the effective utilization of available resources. Iraq's universities have had to contend with a variety of issues, such as inadequate finance, unstable political environments, and outdated administrative frameworks. In order to increase process efficiency in Iraqi institutions, a management information system (MIS) is suggested as a solution in this study article. The financial administration, course scheduling, and student registration are just a few of the operations that the MIS will be built to unify and streamline. Additionally, the system will offer real-time analytics and statistics to help in decision-making and boost overall operational effectiveness. The study would include a thorough design of the suggested MIS as well as a thorough examination of the present difficulties faced by Iraqi universities

2.2.1.2 Objectives

The system aims to achieve several goals. Firstly, it aims to design and implement a system that automates administrative tasks, resulting in decreased manual effort and increased accuracy. Secondly, the study focuses on establishing a robust data management framework that emphasizes data integrity and security. Additionally, the research aims to integrate different processes within universities to streamline operations and improve overall efficiency. Furthermore, the study aims to provide real-time data analytics to assist in informed decision-making for university administration. These objectives are in line with the identified challenges and will contribute to enhancing process efficiency in Iraqi universities.

2.2.1.3 Methodology

The research methodology for improving process efficiency in Iraqi universities through the implementation of a management information system (MIS) involves several steps. These steps include conducting a comprehensive literature review to identify challenges, benefits, and best practices related to MIS implementation. A needs assessment is performed by gathering perspectives from university staff and administrators through interviews and surveys to understand specific requirements. Based on the findings, a detailed design of the proposed MIS is developed, followed by implementation and testing in a selected university. The system's effectiveness is evaluated in terms of efficiency, cost savings, and other metrics. The study's findings are then disseminated to stakeholders, accompanied by recommendations for future research, implementation, and scaling up the system in other universities. Additionally, a survey is designed to collect data on current challenges and issues in the university system. It covers topics such as existing management information systems, administrative process efficiency, and satisfaction levels of students, staff, and faculty. The survey also explores desired features and capabilities of a new system, as well as stakeholder willingness to adopt and use it. The survey is administered to a sample of students, staff, and faculty members.

2.2.1.4 Findings

The research paper presents an automated method for classifying cardiac views in echocardiograms using histograms and statistical features. The Back Propagation Neural Network (BPNN) classifier with histogram features achieved the highest accuracy of 87.5%, effectively classifying four standard cardiac views: parasternal short axis (PSAX), parasternal long axis (PLAX), apical two-chamber (A2C), and apical four-chamber (A4C). The study suggests that the research could be expanded to include additional views like the subcostal and Doppler views for a more comprehensive classification system. This demonstrates the potential of machine learning approaches in enhancing the automatic classification of echocardiogram images, crucial for aiding diagnosis and treatment planning in cardiology.

2.2.1.5 Strengths

The study proposes an innovative Management Information System (MIS) using Oracle APEX to address critical challenges faced by Iraqi universities. By streamlining administrative processes, enhancing data management, and providing decision support, the proposed system has the potential to significantly improve efficiency and effectiveness in university operations

2.2.1.6 Limitations

However, the study acknowledges that the proposed MIS is still in its early stages and has limited features. Further development and rigorous testing are necessary to ensure scalability, adaptability, and alignment with the diverse needs of different universities. Additionally, user training and acceptance may pose challenges during implementation

2.2.2 Course and Faculty Management System [2]

2.2.2.1 Introduction

The Course and Faculty Management System aims to efficiently handle course and faculty data for universities, including tasks like scheduling and resource management. It streamlines processes, saving time and improving decision-making by eliminating manual checks for conflicts and errors. Integrating various functions into one system, it enhances efficiency and accuracy for university schedulers. Moreover, it enables better access to information, improved services for faculty and students, and reduced business risks. Additionally, the system's data can be utilized for generating contracts and providing insights through analytics-driven reports

2.2.2.2 Objectives

The system is designed to efficiently organize and manage courses and faculty within educational organizations. The system's objectives include developing a web app using a low-code interactive framework to support a broad spectrum of projects for computer science senior project students. It aims to create an interactive, responsive, secure, and database-driven application that allows public users to view course offerings and associated instructors while enabling authorized users to edit, add, or delete course-related data. Admins have additional capabilities such as mass importing/exporting course data and editing user permissions, all aimed at improving the scheduling process and reducing manual errors

2.2.2.3 Methodology

The System Methodology of the Course and Faculty Management System is based on a low-code interactive framework that utilizes a full-stack web application approach. It comprises three main components: the User Interface (UI), Business Logical Layer (BLL), and Data Access Layer (DAL). The UI is built with HTML, CSS, and JavaScript, while the BLL and DAL are developed using PHP and MySQL. This architecture facilitates the management of courses and faculty by enabling viewing, adding, editing, and deleting operations within the system, ensuring data integrity and security against SQL injection. The system is designed to be responsive and accessible across various devices, improving the efficiency and accuracy of university schedulers.

2.2.2.4 Findings

The Course and Faculty Management System is designed to help educational organizations efficiently manage courses and faculty. It is an interactive, responsive, and secure web application that allows public users to view course offerings and instructors, while logged-in users with appropriate permissions can edit, add, or delete courses, departments, and instructors. The system also supports mass import and export of course data, ensuring data integrity and reducing manual errors. The project was successfully implemented and tested on a web hosting server, demonstrating its potential to streamline university management processes.

2.2.2.5 Strengths

The system offers a broad spectrum of projects for computer science students, allowing them to work with various technologies. It provides an interactive, responsive web application that enhances efficiency in organizing and managing courses and faculty, reducing manual errors.

2.2.2.6 Limitations

Being a new application, it has limited features and requires further development. Additionally, the mass import feature's data format restriction could be improved for flexibility. Lastly, advanced data analytics and reporting capabilities are currently lacking.

2.3 Synthesis and Comparison

2.3.1 Common Topics

Both “Research Paper 1” and “Research Paper 2” appear to focus on the theme of educational technology, specifically in the context of university course and faculty management systems. They discuss the design, implementation, and testing of such systems, emphasizing their potential to improve efficiency and optimize course scheduling. The papers also highlight the use of various technologies, including SQL, MySQL, and PHP, in the development of these systems. Furthermore, they suggest that these systems could be expanded to generate analytical reports and assist in tasks requiring course and faculty data. It’s important to note that this is a high-level summary, and the papers may contain more detailed and specific themes or topics

2.3.2 Contrast in Methodologies

Research Paper 1 ("Improving Process Efficiency in Iraqi Universities: A Proposed Management Information System") uses a survey-based research methodology. The researchers surveyed to gather data from university staff and students. The findings from this survey were then used to design a Management Information System (MIS) based on Oracle Application Express (APEX). Research Paper 2 ("Course and Faculty Management System") does not require manual data collection as it employs a low-code interactive framework. The researchers developed a web app for the broad needs of different fields using this framework. Research Paper 1 proposes a system based on the survey findings. The proposed system was evaluated based on its alignment with the regulations and policies of the Ministry of Higher Education in Iraq. Research Paper 2 focuses on improving course and faculty management through a web app. The system is designed around the course and instructor models, storing user-specific information about courses, instructors, subjects, departments, terms, timeslots, campuses, and course attributes. The system also provides filters and search functionality for entities such as courses and instructions

2.3.3 Consistencies

Both papers focus on improving efficiency in educational institutions through the use of information systems. They both identify the need for better data management and communication between departments

2.3.4 Contradictions

The first paper proposes a system based on survey findings and focuses on process efficiency, while the second paper develops a web app using a low-code interactive framework and focuses on course and faculty management. The methodologies and the specific problems they aim to solve are different

2.3.5 Gaps and Limitations

in Research Paper 1 (Improving Process Efficiency in Iraqi universities) The paper identifies a lack of automation, poor data management, and inadequate communication between departments as the main challenges in Iraqi universities. However, it does not provide a detailed analysis of how these challenges impact the quality of education or the administrative burden on staff and students. The proposed Management Information System (MIS) is based on Oracle Application Express (APEX), which may limit its applicability to universities that do not use this platform. The paper suggests that further research and implementation are needed to fully realize the benefits of the proposed system, indicating a gap in the current research. in Research Paper 2 (Course and Faculty Management System) The paper acknowledges that the current version of the system is limited in features. It allows privileged users to perform create, read, write, and delete operations on the connected MySQL database, but other functionality in the application is more limited. The paper identifies potential expansions in two categories: data, and data analytics. This includes adding ascending and descending ordering features for each column on the course page, building a notification system around the administrators, and implementing filters and search functionality for entities such as the courses and instructions. The paper also notes that data imported using the mass import feature currently requires data to be in an exact format, which could be a limitation for users who have data in different formats.

2.3.6 Comparative Study

Title	Improving Process Efficiency in Iraqi universities: management information system	Course and Faculty Management System
Benefits	- Integrates and streamlines various university processes like student registration, course scheduling, and financial management - Provides real-time data and analytics to support decision-making - Improves overall operational efficiency - Increases transparency and accountability	- Allows mass import and export of course data, reducing manual errors - Automates checking for errors and conflicts in course scheduling - Provides a centralized system for managing courses, instructors, departments, etc. - Potential for generating analytical reports and instructor contracts
Drawbacks	- Implementation challenges like lack of funding, political instability, limited IT infrastructure, and technical expertise in Iraqi universities - Requires careful planning and understanding of university staff needs - Data security concerns	- Limited functionality in the current version - Lacks advanced features like filters, search, and data analytics - Requires manual data entry or import of data in a specific format
Rating (out of 5)	4	3.5

2.4 Implications and Future Directions

2.4.1 Implications of the collective finding and conclusion

Research Paper 1(Improving Process Efficiency in Iraq): The findings and conclusions of this paper imply that implementing a Management Information System (MIS) using Oracle Application Express (APEX) can significantly improve process efficiency in Iraqi universities. This could lead to an increase in the quality of education and a reduction in the administrative burden on staff and students. However, the paper also suggests that further research and implementation are needed to fully realize the benefits of this proposed system.

Research Paper 2(Course and Faculty Management System): The findings and conclusions of this paper imply that the system is excellent at receiving and storing data, and the next step is for the application to use the data to create exports. The data stored in the Course and Faculty Management System could also be provided for other purposes, such as assisting in generating contracts for instructors. However, the paper also identifies potential expansions in two categories: data, and data analytics. This includes adding ascending and descending ordering features for each column on the course page, building a notification system around the administrators, and implementing filters and search functionality for entities such as the courses and instructions. Collective Implications: Both papers highlight the importance of efficient data management and communication in educational institutions. They suggest that implementing information systems can significantly improve these aspects, leading to better services for faculty and students, fewer business risks, and increased income. However, both papers also acknowledge that there are limitations to their proposed systems and that further research and implementation are needed. This suggests that while information systems can greatly improve efficiency in educational institutions, they are not a one-size-fits-all solution and must be tailored to the specific needs and context of each institution.

2.4.2 Contributions of Two Research Papers

The first paper, "Improving Process Efficiency in Iraqi Universities: A Proposed Management Information System," provides a valuable case study on the application of a Management Information System (MIS) in the context of Iraqi universities. It highlights the challenges of process inefficiency and proposes a solution that could potentially enhance the quality of education and reduce administrative burdens. This research enriches the existing body of knowledge by demonstrating the practical implications of MIS in a real-world setting, emphasizing the need for systems that are both adaptable to local regulations and capable of addressing specific institutional challenges.

The second paper, "Course and Faculty Management System," complements the first by showcasing a different approach to system development through a low-code interactive framework. This paper's focus on user-specific data management and the potential integration of advanced data analytics features presents a forward-thinking perspective on how educational institutions can leverage technology to streamline operations. By discussing the limitations of current data import methods and suggesting improvements, the paper adds depth to the conversation about educational information systems. Together, these papers underscore the importance of continuous innovation and research in the field, providing a roadmap for future advancements that can cater to the evolving needs of educational institutions.

2.4.3 Areas Requiring Further Research

In "Improving Process Efficiency in Iraqi Universities," the research delves into the impact of automation deficiency, data mismanagement, and communication gaps among departments on education quality and administrative workload. Qualitative and quantitative analyses are suggested to understand these dynamics better. Additionally, the study proposes exploring the adaptability of the Management Information System (MIS) beyond Oracle Application Express (APEX) to enhance its versatility across various platforms. To validate its efficacy, real-world implementation, and longitudinal evaluations are recommended, encompassing case studies and pilot programs.

In "Course and Faculty Management System," emphasis is placed on expanding the system's features, including advanced analytics, administrator notifications, and enhanced data import capabilities. Research is needed to grasp the user experience, identify challenges, and solicit improvement suggestions. Furthermore, investigating the broader utility of stored data for tasks like contract generation or decision support could enhance system functionality, potentially through module development or integration with existing systems.

2.5 Conclusion

The literature survey in the document focuses on the application of automation and data management in educational institutions, specifically universities. Two key projects are discussed: a Management Information System (MIS) for Iraqi universities and a Course and Faculty Management System. Both projects aim to streamline administrative tasks, improve efficiency, and enhance communication within departments. The MIS project, based on Oracle Application Express (APEX), is designed to address specific institutional challenges in Iraqi universities. The Course and Faculty Management System, developed using a low-code interactive framework, focuses on course and faculty management, reducing manual errors and improving decision-making.

The topic of automation and data management in educational institutions is highly relevant in today's digital age. Technological advancements have transformed various industries, and education is no exception. Implementing automation in education requires a careful approach, considering the unique dynamics of educational institutions and involving collaboration from stakeholders. The projects discussed in the document aim to automate departmental processes, enhancing departmental quality, performance, and communication. This not only improves efficiency but also allows humans to focus on more complex and creative tasks, thereby enhancing the overall quality of education.

In conclusion, the document emphasizes the potential of automation and data management in transforming educational institutions. By implementing systems like the MIS and the Course and Faculty Management System, universities can streamline operations, optimize resource utilization, and improve their ability to fulfill their mission. However, it's important to note that these systems are not one-size-fits-all solutions and must be tailored to the specific needs and context of each institution. Further research and implementation are needed to fully realize the benefits of these systems and drive positive change within the department

2.6 Reference

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