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Future Directions and Suggestions for the Management Information System's Design and Implementation

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***Abstract*: Software technology is now widely used as a result of recent developments in computer technology. Rapid advancement in all spheres of life has also been facilitated by software systems. The management of schools and pupils has been substantially improved by the introduction of software solutions. This essay primarily examines and condenses the importance, key features, and drawbacks of the student information management system. Future directions for MIS design and implementation include the integration of advanced technologies like AI and machine learning for better analytics, enhanced security measures, and a focus on sustainable and ethical practices. Recommendations involve building robust implementation plans that include comprehensive risk management, clear outcome definition, and the proper selection of vendors and solutions to meet organizational needs.**

Keywords: Management Information System (MIS), Personal Computer (PC), Visual Studio, Students Records, Easily Accessible.

I. INTRODUCTION

The early management information system (MIS) for organizations, industries, institutions, and schools was first established in the year 1978 by a researcher named Raymond Bily when he was a student at Asheville High School. It was then firstly established by a researcher named Philip Neal, a teacher at Lea Manor High School, from the year 1982 to 1983. Bedfordshire County Council (Lea Manor's local education authority) then further developed this product, which began being used by other schools in 1984. In 1988, a commercial company, SIMS Ltd, was founded to further develop SIMS. SIMS Ltd was acquired by Capita Group in 1994. In December 2020, Capita decided to sell their Education Software Solutions business (whose flagship product is SIMS) to private equity house Montagu to reduce debts. Montagu has stated that they intend to continue developing SIMS with a plan to release the latest version, SIMS 8 after the acquisition process has been completed [1]. With the hasty improvement of the higher educational system, the enrolment scales of major universities and colleges continue to magnify. The quantity of students at school has improved cuttingly, and numerous new disciplines and majors have been opened in the schools or institutions. The types, batches, and majors of the college's students are miscellaneous. These make the individual data management of students very byzantine. Counting the students' data needs a lot of time and energy in daily teaching work. Faced with this enormous quantity of data, to work efficiently, we have to create a student personal information management system to manage this data. The information management system is primarily to manage the important data of the students in institutions, schools, and colleges. The student data is an essential bystander of student development. As a significant folder data of students, the utilization and management of the student data are very imperative. The old-fashioned management style is mostly bifurcated by the academic management departments of the different majors of the institutions, schools, or colleges to physically maintain and enter the student data. Due to the shortage of a fused data broad management podium, joined with high-intensity information processing workload and regionalized management of data, the speed of data collation is slow, information loss is prone to occur, statistical errors, query work is inopportune, and management personnel spends a lot of money. Time and energy have had a certain influence on other work in terms of data management. Thus, an integrated management system for the individual data of the whole institutions, colleges, and schools is required for the management of colleges and universities information. The establishment of the system can not merely realize data sharing, facilitate inquiry and management, speed up the import of related data, streamline manpower, free management staff from monotonous information processing tasks, and strengthen the relationship between different professions and departments. There is information exchange between the college and students, parents' understanding of the students' situation at school, and data analysis of the students. Figure 1 below shows the student's information management system.

Fig. 1. Student information management system

II. RELATED WORKS

A ChatBot is a software that simulates human communication via speech or text. One of the initial Chatbot was developed and established for discussion among the machine and the user. This Chatbot is fabricated based on the user interface, permitting this user to type the probe and assent the response in the text as well as speech. The college inquest Chatbot is installed on artificial intelligence algorithms that study the user interrogations and sense the user`s message. With the assistance of the artificial algorithms, the Chatbot answers the interrogation asked by the students without physically being available in the college. It uses artificial intelligence methods such as Natural Language Processing, image and video processing, and audio analysis. Porter Stemmer Algorithm and Word Order Similarity between Sentences is used for removing the suffixes from the word in English. The system assisted many organizations to ensure good services and customer satisfaction with the less human intervention [3]. Additional seminal Chatbot, known as UniBOT was established for University Data System. The Chatbot provides information associated with university OR college and likewise about student happenings. As the student has to visit the college or institute to collect different information or notices like Tuition Fees, Defaulter List, Academic schedule. This practice can be time-consuming and tedious and to overcome this Chatbot is introduced. Besides the academic information, this Chatbot can likewise be used to provide extra data using Natural Language Processing [4]. Applying the Robotic Process Automation (RPA) in administrative processes of public administration provides the benefits of RPA and applications of RPA in diverse areas. This automates the functions and processes by decreasing the cost through the introduction of the robotization process. Modern technologies are carried out in all the areas of activity speedily. Technologies are meant to improve or optimize the process of management and development of organizations, by bringing the new level of proficiency of quality of services. Smart devices and intelligent machines perform many jobs and operations in manufacturing. The RPA is used as specialized software that simulates human interaction with the data system to carry out a business process. [5]. In Explained Analysis of Robotic Process Automation Tools, a detailed study of the leading RPA platforms namely, UiPath Studio, Automation Anywhere (AA), and Blue Prism (BP) is shown. When swiftness is expected in all the sectors, the speed of execution of different processes becomes an essential factor. They compared these tools considering different factors such as Front office automation, back-office automation, security, its code-free and user-friendly nature [6]. RPA has likewise been found to be critical in automating processes within an ERP system. ERP-based processes are structured by first identifying significant business processes, aligning different activities in an order of events, and aligning all processes based on definite business logic. Research showed that using RPA technology, information mining processes using BOTs can replace human processes and thereby enhance ERP processing [7]. Using RPA and ChatBot, it can be demonstrated that the Student Information Management within an ERP system can be efficiently managed with no errors. It will not only automate repeatable tasks but will allow efficient management of numerous functions based on set business rules [8].

III. MANAGEMENT INFORMATION SYSTEMS PROVIDES THE FOLLOWING ADVANTAGES

1. It simplifies scheduling: The MIS improves the eminence of plants by providing significant data for sound pronouncement making. Due to an upsurge in the size and complexity of organizations, managers have lost personal contact with the scene of operations.

2. In minimizing information overload: Management information systems (MIS) change the larger amount of information into a summarized form and thereby avoid the confusion which may arise when managers are flooded with detailed facts.

3. Management information system (MIS) Inspires Decentralization: Decentralization of authority is possible when there is a system for monitoring operations at lower levels. MIS is successfully used for measuring performance and making necessary changes in the organizational plans and procedures.

4. It brings Co-ordination: Management information system (MIS) facilities integration of specialized activities by keeping each department aware of the problem and requirements of other departments. It connects all decision centers in the organization.

5. It makes control easier: Management information system serves as a connection between managerial planning and control. It increases the ability of management to improve and evaluate performance. The used computers have increased the information processing and storage capabilities and reduced the cost.

6. Management information system assembles, processes, Retrieves, stores, evaluates and disseminates the information [9].

IV. MANAGEMENT INFORMATION SYSTEMS PROVIDES THE FOLLOWING DISADVANTAGES

1. It is highly sensitive and needs constant monitoring.
2. The Budgeting of management information

systems is enormously challenging.
3. Quality of outputs is governed by the quality of inputs.
4. Lack of tractability to update itself.
5. Helpfulness decreases due to frequent changes in top management [9].

V. RESULT AND DISCUSSION

The computer software application was designed to have three main sections, namely; the login window, the main menu, and the sub-menu. The login window requests a valid username and password from the administrator to be able to gain access to the software. The administrator is any staff that is authorized by the management of the institution to be in charge of the exams and records unit, hence he should have a valid username and password created by him to be able to login to the software. Main Graphical User Interface (GUI).

The GUI is a way to interact with a computer using pictures and other visual elements displayed on the computer. The graphical user interface is important to make the user an easy to understand what he needs to do to use the program to make the GUI functions work properly, must insert Microsoft visual studio coding of its elements. The main interface of the system contains all the subinterfaces, the sub-interfaces are the admin form, register new students, and display student information. The login window enables the user to enter his/her password. If the password entered is valid, the software will then display the main menu. Nevertheless, if the password is not valid the user will be denied access to the program.

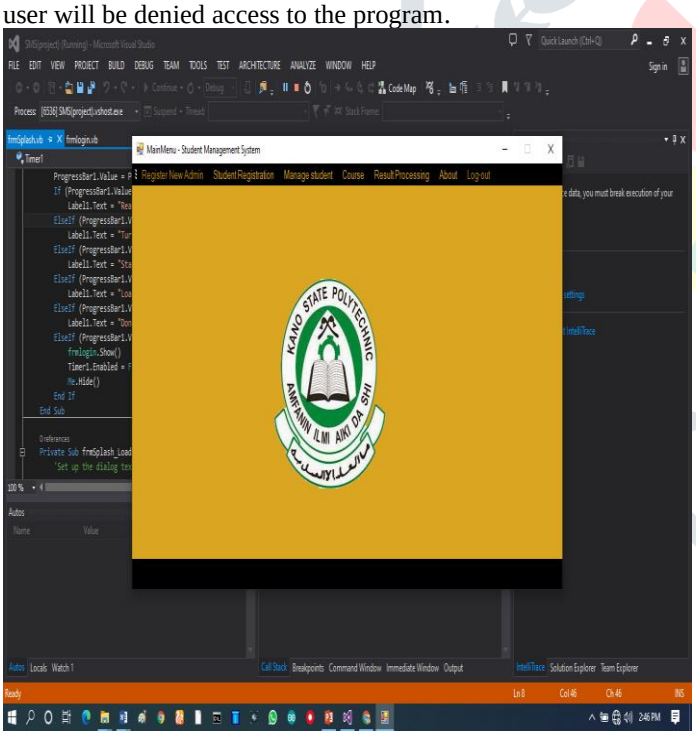

Fig. 2. Student management information system (Main Interface)

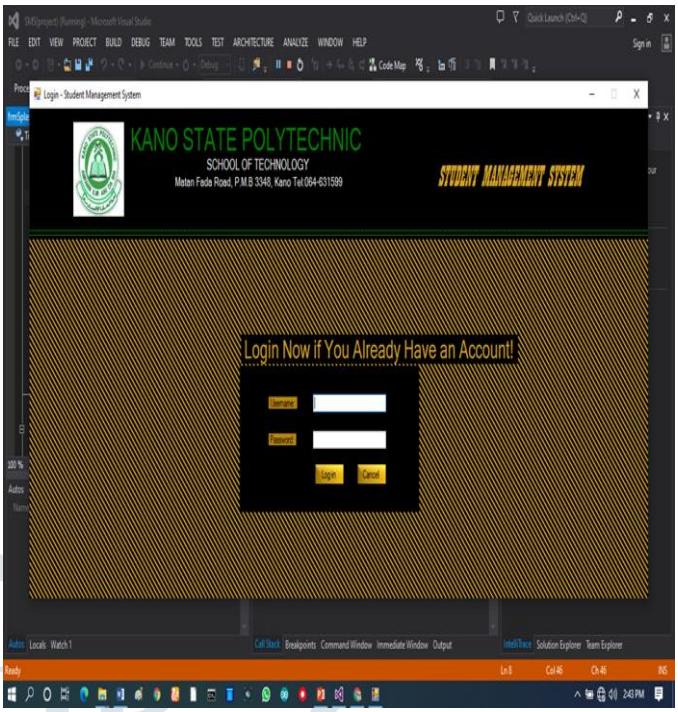

Fig. 3. Login interface

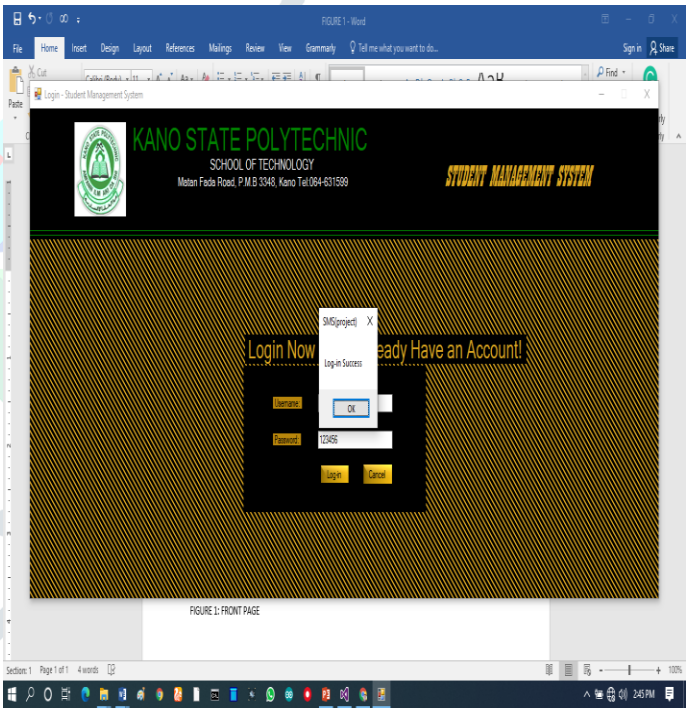

Fig. 4. Login successful

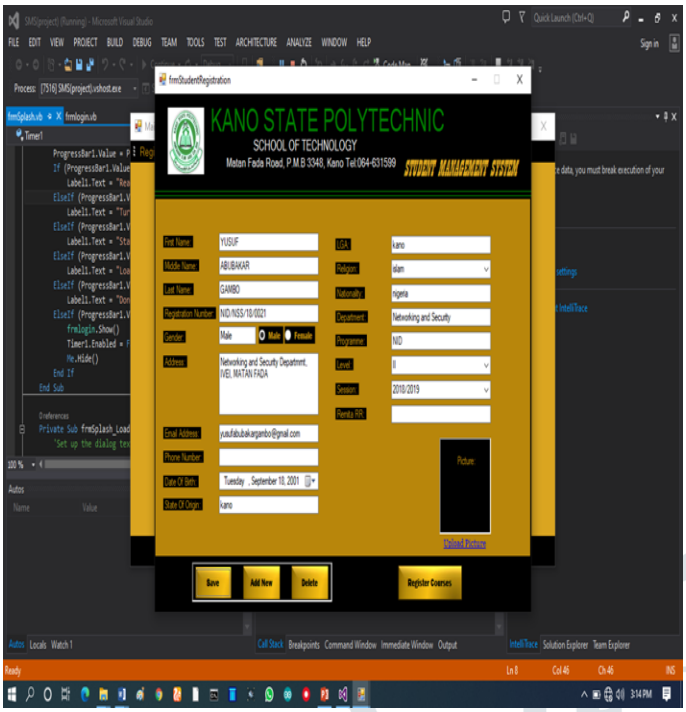

Fig. 5. How record is uploaded in the system

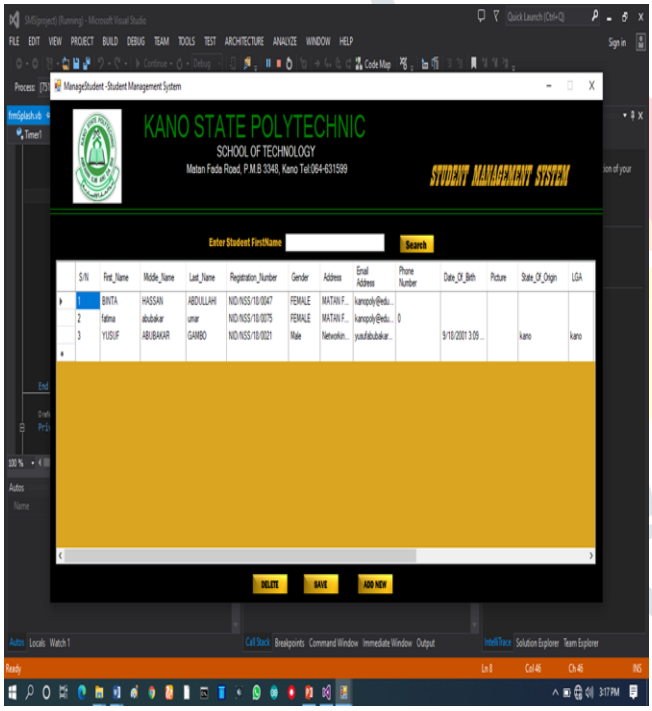

Fig. 6. The saved records uploaded

CONCLUSIONS

With the development of society and technology, it is an expected development to apply computer management systems to school student management. This can not merely manage student data better, but likewise, advance the reasonable management of student information. This can also promote the effective development of school education [10-16].

Future directions

i. **Artificial Intelligence (AI) and Machine Learning:** Implement AI and machine learning for automated processes, improved predictive analytics, and more accurate insights to enhance decision-making.

ii. **Cybersecurity and Ethical Practices:** Prioritize robust information security, including risk management and ethical hacking, to protect data and align with the growing importance of purpose-driven and ethical management.

iii. **Data Analytics and Visualization:** Utilize data analytics and visualization tools to make complex data more understandable, enabling managers to gain deeper insights from the information systems.

iv. **Integration with other systems:** Develop systems that seamlessly integrate with other business functions like supply chain management, e-commerce, and health informatics, creating a more holistic view of the organization.

Recommendations for implementation

i. **Strategic planning:** Clearly define desired outcomes and the specific needs the MIS must fulfill to ensure the project aligns with business goals.

ii. **Cross-functional teams:** Assemble a dedicated team with representatives from all relevant departments to ensure the system meets the needs of all users.

iii. **Thorough vendor selection:** Choose vendors carefully based on their ability to provide the right solutions and support throughout the implementation and operation phases.

iv. **Comprehensive implementation plan:** Develop a detailed implementation plan that outlines all steps, from initial installation to user training and ongoing support.

v. **Risk management:** Proactively identify and manage potential risks that could derail the project, such as budget overruns, technical issues, or resistance to change.

vi. **Phased rollout:** Consider a phased implementation, which can involve a parallel operation of old and new systems to ensure a smooth transition and minimize disruption.

vii. **Continuous evaluation:** After implementation, continuously evaluate the system's performance and make adjustments as needed to ensure it continues to meet evolving business requirements.

REFERENCES

[1] Available online: https://en.wikipedia.org/wiki/School_Information_Management_System

[2] Y Chu, "*Construction of Student Personal Information Management System Relying on Computer"*, Journal of Physics: Conference Series 1915, IOP Publishing, doi:10.1088/1742-6596/1915/4/042080, 2021.

[3] K., Bala, M., Kumar, S., Hulawale, S., Pandita. "Chat-bot for college management system using AI." International Research Journal of Engineering and Technology, vol. 4, no. 11, 2017.

[4] P., Neelkumar, P., Devangi, P, Darshan A. Patel, "AI and Web-Based Human-Like Interactive University Chabot (UNIBOT)", in 2019 3rd International Conference on Electronics, Communication and Aerospace Technology (ICECA), pp. 148-150. IEEE, 2019.

[5] U, Raissa, Z, Kalpeyeva, R, Satybaldiyeva, A, Moldagulova, A, Kassymova. "Applying of RPA in Administrative Processes of Public Administration." In 2019 IEEE 21st Conference on Business Informatics (CBI), vol. 2, pp. 9-12, 2019.

[6] I, Ruchi, R, Muni, K, Desai, "Delineated analysis of robotic process automation tools", In 2018 Second International Conference on Advances in Electronics, Computers, and Communications (ICAECC), pp. 1-5. IEEE, 2018.

[7] F, Peter, L, Peter, "Structuring Information Systems in the Era of Robotic Process Automation" In ResearchGate, 10.1314 0/RG.2.2. 18811.36648, 2018.

[8] V, Gajra, K, Lakdawala, R, Bhanushali, S, Patil, "Automating student management system using chatbot and RPA technology", Electronic copy available at: https://ssrn.com/abstract=3565321.
[9] http://dipak-knowledgestore.blogspot.com/2010/08/advantage-disadvantages-of-mis.html.
[10] I. A. Ibrahim, Y. Abubakar, "The Importance of Identity Management Systems inDeveloping Countries", International Journal of Innovative Research in Engineering & Management (IJIREM)ISSN: 2350-0557, Volume-3, Issue-1, January-2016.
[11] I. A. Ibrahim, I. B. Mohammed, B. Saidu, "Fraud Management System in DetectingFraud in Cellular Telephone Networks", International Journal of Innovative Research in Computer Science & Technology (IJIRCST)ISSN: 2347-5552, Volume-3, Issue-3, May-2015.
[12] L. S. Lawal, et. al., "Digital Health Inclusion: A Pilot Study of HealthServices Deployment Using CommunicationsSatellite for the Underserved in Nigeria", 2022, DOI: 10.2139/ssrn.4141456.
[13]] L. S. Lawal, et. al.," Overview of Satellite Communications and itsApplications in Telemedicine for the underserved inNigeria: A case study", Proc. of the International Conference on Electrical, Computer, Communications and Mechatronics Engineering (ICECCME)16-18 November 2022, Maldives.
[14] I. A. Ibrahim "Nigeria's Ethical Issues in the Use of ICT", June 2018ITNOW 60(2):12-13, DOI: 10.1093/itnow/bwy035.
[15] I. A. Ibrahim, M. Abubakar, "Technological Adoption of e-Commerce in Nigeria", International Journal of Innovative Research in Engineering & Management (IJIREM) ISSN: 2350-0557, Volume-2, Issue-6, November- 2015.
[16] M. A. Baballe, et al., "Design and Implementation of the Management Information System", 1st International Conference on Engineering and Applied Natural Sciences, https://www.iceans.org/ May 10-13, 2022, Konya, Turkey.