




## Implementation of ERP at the Higher Education Institutions (HEIs): Challenges and benefits

Merouani Hamida * 	Boudjemil Ahmed
merouani.hamida@cu-tipaza.dz	Taha.boudjemil@yahoo.fr
Local Communities' Management and Role in Development Lab (Univ.Blida2) University Center Tipaza (Algeria)	University Center Tipaza (Algeria)

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### Abstract:

The study aims to investigate the integration of Enterprise Resource Planning (ERP) systems in higher education institutions (HEIs) and emphasize their impact on improving administrative and educational processes, as well as the main challenges they may face. This study adopts a qualitative case study approach to analyze the implementation of ERP systems SAP and PROGRES across different institutions.

The findings highlight the importance of strong administrative support, staff training, and robust infrastructure for successful ERP implementation. However, challenges such as resistance to change and resource constraints were also identified. Despite these challenges, ERP systems provide significant opportunities for HEIs to enhance the quality of administrative and educational processes and improve decision-making.

**Keywords:** ERP, SAP, PROGRES, Integration, HEIs

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\* Corresponding author

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## **1- Introduction:**

In recent eras, the global landscape has shifted towards megatrends driven by technology, compelling modern enterprises to integrate technological and infrastructural tools such as computers, networks, information systems, and the internet into technology-based management.

Therefore, like other sectors, the higher education sector faces challenges in developing information systems to handle the complex needs and increase the value of different operations within these institutions, requiring it to adopt new strategies to manage its resources more efficiently and improve its operations, functions, and services. That's why higher education institutions (HEIs) need to stimulate development in research, teaching, learning, and administration by using an adequate information system and adopting new strategies and plans to improve their performance. accordingly, universities use ERP to cope with this great change worldwide.

Nowadays, enterprise resource planning, or ERP systems, is moving from business services for profitable organizations to non-profit ones, for academic issues and purposes, and with specific stakeholders, primarily students, teachers, and staff. Hence, universities should adopt holistic changes to achieve their goals of improving overall performance, but it is still hard to cope with this advanced technology software, in facing hurdles, that cease to best implementations within these institutions that rely on huge and complex packages.

Countries worldwide strive to better integrate ERP in their higher education sectors. "SAP" and "PROGRES" for instance, are ERP systems implemented in different countries, "PROGRES" is designed particularly to manage all the higher education institutions in Algeria, while "SAP" is a multi-services company that affords ERP systems for various sectors including the higher education sector.

### **General problematic:**

Implementing ERP is crucial for universities to cope with the advancement of technology, even though the challenges may be encountered. So, the general question could be as follows:

What are the benefits of implementing ERP at higher education institutions, and what are the main challenges that may be faced?

**Sub-questions:**

- What are the success factors for ERP at higher education institutions?
- What are the advantages of implementing ERP at HEIs?
- What hurdles impede the ERP application in higher education?
- How do "SAP" and "PROGRES" impact academic business in universities?

based on previously mentioned questions, the following hypotheses may be proposed:

**- Hypotheses:**

- There are limited success factors for implementing ERP at higher education institutions.
- Implementing ERP enhances the overall performance of universities.
- There are a lot of challenges that hinder the success of implementing ERP.
- "PROGRES" and "SAP" increase the efficiency of university performance.

**- Objectives and importance of the study:**

**- Objectives:** The main aim of this study is to highlight the importance of integrating ERP in the higher education sector in addition:

- To extend and develop a theoretical framework regarding the study terms
- To support decision-making: in educational institutions.
- To outline the success factors while implementing the ERP system

**- Importance:**

- Highlighting the pivotal role of ERP systems in the development of the higher education sector.
- Providing decision-makers in educational institutions with the information and knowledge needed to make informed decisions about adopting these systems.
- This study can be a valuable reference for researchers and those interested in the education and information technology sector.

### **Methodology:**

This study relies on the case study to analyze the application of ERP systems in higher education institutions and characterize the features about the implementation

### **2- Literature review :**

#### **2-1 An overview of ERP at higher education institutions HEIs :**

Scholars define ERP at HEIs from many perspectives as follows:

ERP system is a generic software package that encompasses the whole adopted organizational activities and processes, to save costs and improve solutions, and also getting the opportunities to update procedures (Pollock & Cornford, 2004, p. 33). And it's also software used by organizations that do business for profit and non-profit purposes. And universities as non-profit organizations, have different environments and circumstances for academic purposes (Abugabah & Sanzogni, 2010, p. 395). Moreover, an ERP system for higher education institutions is an information technology solution that integrates and automates administrative services such as accounting human resources, payroll, and academic services including all aspects of student records (FRIMPON, 2012, p. 232), and comprises also, different scopes such as human resources systems, administrative student information systems, and financial systems (Noamana & Fouad Ahmed, 2015, p. 386). It's also an interconnected software with one data storage, designed to coordinate all the sources, activities, and information (Andrianto, 2019, p. 3). In addition of that, Enterprise resources planning, or ERP, is a comprehensive software system designed to integrate all the departments, processes, and tasks within the organization, trying to achieve perfection and growth in efficiency (Tambovcevs & Tambovceva, 2022, p. 16).

In conclusion, ERP for non-profit organizations is a system adopted by the higher education sector that covers all departments of the institutions, including their operations, functions, and activities, to manage resources and improve the sector's overall performance.

According to the descriptions provided above, the application of ERP in HEIs characterizes the following features:

ERP systems can be used to manage non-profit organizations, such as higher education institutions, and for academic purposes. So, it interconnects all the departments, the different modules, and the sources of universities, including administration, student life cycle, human resources, finance ...etc. ERP systems create a unified database that fosters interdepartmental communication and improves decision-making. This integration gives opportunities for procedures to be updated and enhanced as well.

### **2-2 types of ERP at higher education institutions with comparison:**

Scholars determined three forms of ERP regardless of the implementing organization's kind:

#### **2-2-1 types of ERP at HEIS:**

Three main types of ERP, firstly, the on-premise ERP is software installed locally on the user's machine. Secondly, the cloud-based ERP where access to the internet is needed for managing the sources. The third type of ERP named hybrid, is a combination of the two previous types of ERP and relies on cloud software runs and hosts on the private server of the organization, and the hybrid cloud infrastructure depends on having a public cloud (e.g. AWS) and a private cloud (in-house) connected (Hayek & Odeh, 2020, p. 56).

#### **2-2-2 Comparison of implementation On-Premise versus Cloud ERP:**

The table below summarizes the main characteristics both of On-premise ERP and based-cloud ERP:

Table: comparion between on-premise ERP and cloud-based ERP:

Features	The On-Premise ERP	The Cloud-Based ERP
Deployment	Installed locally, and required servers and a host computer in the institution	Hosted on cloud servers and accessible via the internet
Management	Requires in-house IT staff (inside the institution)	Managed by the vendor
Implementation rapidity	Slow in implementation	Faster implementation
Security	Requires robust in-house security measures	Vendor-managed security measures
Cost	Higher initial cost, lower ongoing costs	Lower initial cost, higher ongoing costs
Scalability	Less scalable	More scalable

Source: Prepared by the researchers, based on the source( (Al-Badi & Khan, 2022, p. 15)

### **2-3 Functions of ERP in higher education institutions:**

Implementation of ERP systems in the higher education sector helps institutions with the following:

- it combines all the characteristics in an integrated software program that runs on a unique database, where they can share information and communicate effectively (Tambovcevs & Tambovceva, 2022, p. 16). Consequently, enabling efficiency and transparency through the flow of information through the different departments at the university (Khand, 2020, p. 23). Moreover, ERP can enhance and integrate management and administration processes in student enrollment, human resources systems, and financial processing (Tiwari & nitinkalla, 2021, p. 239), and manages operations including student registration and grades, fees, library, courses, timetabling, and all issues about staff. This integration fosters transparency and clarity, effectiveness, and productiveness (Al-Badi & Khan, 2022, p. 15).

### **2-4 Benefits of implementation of ERP system at higher education institutions:**

Lately, universities have recognized that implementing ERP in universities is very essential for better performance besides:

- Improvement of the information access for planning and strategic management, with the possibility of getting information easily and in one place. In addition, the enhancement of services to students, employees, and other stakeholders, and the improvement of the operational efficiency (Khand, 2020, p. 40).
- Internal control refers to the capability of users to monitor, verify, and regulate all administrative operations in a single, and unified platform. Even for students, they can improve their workflow efficiency: By exploiting specific applications, students can rapidly access their records, including fee payments, assignment submissions, feedback remarks, and performance records (Kiruthiga & Vijaya, 2022, p. 1800).
- Reducing the amount of the data entry (Rajan & Baral, 2015, p. 106)
- ERP increases the speed of information transactions (Tambovcevs & Tambovceva, 2022, p. 16) between various business functions and external stakeholders. In

this case, students are the stakeholders (Giri, Pandey, Devang, Sharma, & Sethy, 2021, p. 10).

- The application of ERP systems in the education sector aims to improve customer service, where students are the main stakeholders. By effectively managing their data, from attendance to results, the quality and transparency of the data improves, allowing it to be displayed to college officials and parents when needed. The system also enhances the enterprise's competitiveness by improving the efficiency of curriculum coverage and implementing activities that assist in obtaining good assessments from government authorities. In addition, it contributes to improving teaching and learning processes by enabling students to share educational materials and presentations (Tiwari & nitinkalla, 2021, p. 249).
- It provides institutional members with access to a wide and diverse range of data and information sources and enabling to work smoothly with data derived from different sources (Soliman & Karia, March 8-10, 2016, p. 1939).
- ERP is also an innovative technology because of its beneficial outcome, due to better information access for planning and managing the institution, better services for the faculty, students, and staff, and lesser business risks. Moreover, bigger income and declined expenses due to enhanced efficiency (Soliman & Karia, 2015, p. 381)
- It helps to connect all the institution units, departments, and sub-systems in a unique database in which all functions are fully integrated (Al-Badi & Khan, 2022, p. 15).

### **2-5 Factors of success of ERP in higher education institutions :**

Factors of success are variously identified in different studies. For instance, the study of (Abdel-Haq, Chatti, & Asfoura, 2018, p. 3631) determined that success factors comprise four categories :

- a- The success of information systems is revealed in the role of users the availability of skills, and the presence of a sponsor.

b- The software package's success, is explained by the commitment of administration and the ERP system's implementation procedures (such as project management, hardware, and software).

c- Success management of the ERP implementation project, with factors such as communication, recruitment of specific staff, application of project plan versus timeline, controlling, and feedback of each stage

d- Success relating to the actual implementation of ERP systems, which requires information technology projects.

For the study of (Goel, Kiran, & Garg, 2011, p. 13201), the critical success factors of an ERP in higher education institutions are first, the functionality of the ERP including operational efficiency in issues of efficient features of the system, reducing efforts and user readiness, and user accessibility in dealing with the interface usage, data storage, and training. Secondly, the security of the ERP appears in user security with authorization security, data confidentiality and authentication safety; and system security in server downtime, system failure chances, and biometric measures. Thirdly, the quality which covers two aspects namely, usability in availability, average error rate, increased efficiency, and correction time, and the scalability in easy additions and interoperability.

The ERP system should be modular, integrated, parametric, flexible, secure, multi-functional and should manage the workflows to be efficient (Goel, Kiran, & Garg, 2011, p. 13198)

#### **4-6 Challenges of implementation of ERP in universities:**

Implementing ERP systems in higher education institutions may face various challenges, both about the complexity of the higher education sector environment, and the various stakeholder purposes from professors, students, and management staff. Therefore, several challenges can be defined such as:

- Lack of interconnection between different departments of universities (FRIMPON, 2012, p. 232).

- The high cost of planning, configuration, implementing, and customization, of the ERP system could be too much, especially for non-profit institutions. In addition, the lack of knowledge about the system, resources and technology personnel (Tiwari & nitinkalla, 2021, p. 250).
- Difficulties in integrating the different departments, units, and systems, which could lead to deficiency in interdepartmental cooperation and effective communication, besides, difficulties in accessing real-time information that may interrupt many pivotal decision-making processes in particular registrations' student, class timetables, teaching, and examinations (Mishra, Newase, & Hota3, 2020, p. 3864)
- Universities may also face resistance to ERP implementation as it involves not only the integration of a new information system, but a holistic modification of the organization's culture. Moreover, the implementation of ERP relies heavily on the administrative authority model of governance, so for academics, this model may lead to a loss of academic control, which increases the transparency of academic issues. In addition, administrative staff may have concerns for their job security when tasks are automated (Soliman & Karia, March 8-10, 2016, p. 1940)
- Absence or weakness in e-skills for students, teachers, and staff considered a big barrier to succeeding ERP implementation (Goel, Kiran, & Garg, 2011, p. 13198)
- Time and cost: Many ERP implementation leads to failure due to budget and time overages (AlQashami & Mohammad, 2015, p. 84).

### **3- A case study of ERP systems:**

#### **3-1 The enterprise resources planning "SAP" at King Abdulaziz University:**

##### **3-1-1 Definition of SAP :**

SAP is an integration project abbreviated from systems, Application & Product. It's a comprehensive system with software and hardware components, that provides King Abdulaziz University with practical solutions. So that, it can connect all the university

departments in one single system and manage financial or administrative processes with less effort, and without using paper, or other classic systems (University, n.d)

### **3-1-2 Functions of SAP:**

SAP manages many modules including student life cycle management, business services, governance and compliance, human resources management, performance management, financial management, asset management, and relationship management (Al-Badi & Khan, 2022, p. 16). With these supporting systems from SAP (systems, Last Update 12/13/2022): ERS(Academic applications management), Anjez+(Financial and Administrative Apps Management), Odus+(Academic applications management), Marz(University portal applications management), ETMAM(Financial and administrative applications to manage for university staff, administrators, and academics), PMO(Project management), MyKAU( University's portal applications), KPI(information management and decision aids), PTS(Academic app. for managing student).

### **3-1-3 Objectives of implementing SAP at the Saudian University:**

By implementing SAP ERP at King Abdulaziz University, the administration strives to release a set of objectives cited at the bottom (University, n.d):

- Elaborating an integrated system to manage and plan the King Abdulaziz University resources.
- Enhancing and optimizing the various operational processes.
- Reducing time of operations within the university.
- Integrating all departments through a unified database results in accurate information and well-informed decision-making.
- Providing accurate information for better making decisions via the SAP.

### **3-1-4 Challenges of implementing**

Even though King Abdulaziz University's advantages gained while implementing ERP outweigh the disadvantages, and even a lot of difficulties can be avoided if sufficient funding and training are provided, there are some obstacles registered (<https://e-management.kau.edu.sa/Content-313-en-89970>, consulted 10-11-2024 at 06:43):

- Customization includes a myriad of situations.
- The necessity of reengineering the business operations.
- The ERP systems may endure high costs to install and operate.
- The technical support can be inadequate.
- The Implementing of ERP systems can be difficult both for new institutions and rapidly shifting.

Moreover, additional hurdles could be marked such as (McCann & Grey, 2009, p. 178): developing a dedicated SAP team, hiring skilled SAP staff, and ensuring appropriate funds for technology, manpower, and technical infrastructure.

### **3-2 ERP The enterprise resources planning “PROGRES” at Algerian University:**

#### **3-2-1 Definition:**

In cooperation with the European Union, and the frame of digitalization of the higher education sector, the Ministry of Higher Education started working on a project in 2012; during that year, it defined all the functions, after the project was finished and designed in 2016. Initially, it was used in enrollments of new students with baccalaureate certificates, master's degrees, and PhD degrees and other services such as transport, and transfer. Currently, many portals manage all the university issues including (progres, n.d.): Student portal, management of foreign students, certification of diplomas, doctorate inscription, university works platform, human resource management, common repository, research management, financial and accounting management.

#### **3-2-2 Benefits of integrating PROGRES ERP at Algerian University:**

Algerian University is striving for advantages by implementing “PROGRES” as follows (Ait Azzoug & Draoussi, 2024):

- Supporting the Algerian University in the execution of effective pedagogical governance and the digital transformation of the educational system.
- Standardization of data: Data standardization is essential for enhancing process efficiency and decision-making in universities including Improving data

quality, Facilitating data exchange, Improving decision-making, Facilitating scientific research, and using advanced analysis techniques:

- "PROGRES" works on one single database, that helps deal with accurate information.

### **3-2-3 Challenges of integrating PROGRES system at higher education institutions:**

Algerian universities face obstacles in implementing the PROGRES system (Bouaïsse & Chouchane, 20223):

- Insufficient experience in the application of PROGRESs system.
- Weak commitment and collaboration of different administrative units, delays the implementation of plans.
- Employee resistance to the electronic transformation.

### **Conclusion :**

In conclusion, the application of ERP systems in higher education institutions (HEIs) is considered an important step towards achieving administrative and educational uniqueness in the digital age. The study showed that the application of ERP systems in the higher education sector, significantly contributes to improving operational efficiency, accelerating the flow of information, and reducing costs, thereby enhancing educational institutions' ability to provide quality educational services.

Successful implementation of ERP systems should depend mainly on a range of key factors, most notably strong administrative support, staff training, and infrastructure packages. The case study included in this study, which covered two models of ERP systems (SAP and PROGRES), also showed that the benefits that can be derived include improved management decision-making, enhanced interdepartmental communication, collaboration and coordination between different departments.

However, a set of constraints that the higher education sector may face during the implementation process have been identified, such as resistance to change employees, lack of technical skills, and financial burdens associated with the system's development

and periodic updating. Therefore, the success of the integration requires continuous support from the administration to empower the e-skill of members.

Lastly, ERP technology provides a great opportunity for higher education institutions to improve their internal and external operations, but it requires a long-term commitment to integrated management of technology and human resources, to overcome the challenges and achieve the desired results.

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