

Assessment of the Level of Automation and Utilization of Enterprise Resource Planning System – A Case Study of Kenya Medical Training College

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Abstract— In the twenty-first century, Enterprise Resource Program (ERP) systems have become widely used as the preferred corporate management tools. They are essential in a number of roles, including project planning, administration, finance, human resources, and supply chain management. In order to better management and administration, academic institutions, including Kenya Medical Training College (KMTC), have begun to replace their outdated systems with ERP projects. This study attempted to evaluate the ERP system's installation at KMTC by evaluating the extent of automation in its various departments in improving efficient service delivery. A sample of 115 respondents were chosen using proportionate stratified sampling as part of a descriptive survey research methodology. Statistical analysis reveals that that most of the respondent with less than 50% reported little extent of automation of ERP system. However, the finance department had a large extent of automation as compared to other departments with 51.3%. Additionally, the extent of use of ERP for various functions recorded less than 30% overall in all the operations carried out by the College. In light of these findings, the study proposes stakeholders in KMTC to develop comprehensive ERP implementation plans incorporating change readiness assessments and robust training programs to boost user acceptance and competency.

Index Terms— automation, adoption, ERP, KMTC.

1. Introduction

Worldwide, Enterprise Resource Planning (ERP) systems are becoming more and more popular and are proven to be beneficial in a variety of industries [1]. The demand for ERP systems is evident from the global market statistics. ERP software serves as a centralized management system for integrating various business functions within an organization [8]. Organizations across different sizes and industries, including public-sector entities, have adopted ERP software packages to streamline their operations [6].

In order to automate their operations and align them with their strategic aims, higher education institutions all around the

world are rapidly implementing ERP systems. The comprehensive organizational management strategy of the ERP system and the aim of education managers to improve service quality for students and fulfill local, national, and international standards both contribute to this adoption. ERP system use at educational institutions has made it possible to manage a variety of operational concerns, including hiring employees, managing exams, managing finances, and managing alumni, effectively [9].

A number of advantages are anticipated to result from the installation of an ERP system in academic institutions. These include the effective administration of procedures relating to students, such as the student portal, student clearance, admissions, online applications, fee payments and status, student housing, and the uploading of exam results [2]. The system is able also to speed up document verification, student selection, and real-time updates to student records, as well as make it easier to create exam cards, enable exam revisions, assign lecture rooms and computer laboratories, and generate test schedules. Additionally, the ERP system guarantees seamless module connectivity between departments. In order to lessen the dependency on independent systems, existing consolidated applications including the online admission system, finance system, library management system, and e-learning application would be achieved. Real-time information access, smooth communication, and information exchange between departments would all be made possible by the ERP system. In light of these benefits, this study therefore sought to evaluate the level of implementation and use of ERP within KMTC campuses.

2. Study Area

Kenya Medical Training College (KMTC), a focal point of this study is a government organization founded in 1927 with the goal of supplying top-notch education to satisfy the needs

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of the country's healthcare workforce. The college serves a student body of more than 54,000 with a sizable workforce of around 3,000 personnel and more than 83 programs. The KMTC has developed strategic plans that specify its development goals in order to increase operational efficiency. One of the main elements of the KMTC 2018 Strategic Plan is the gradual implementation of an ERP system, with the aim of obtaining full capability by 2023 [3]. All departments on campuses around the nation could benefit from the better operations made possible by the ERP system because of the gradual rollout procedure. The ERP system would centralize data sources by utilizing cutting-edge technology, enabling thorough reporting while staying flexible to meet future development.

3. Methodology

A. Research Design

This study used a descriptive research methodology in which questionnaires were used to collect detailed data on the participant's perception on the magnitude of automation and use of ERP on key departments of the institution.

B. Sampling Approaches and Sample Size

The study concentrated on KMTC employees from all 71 campuses around the nation, including principals and their deputies, department heads, lecturers, accounting or finance, procurement officers and librarians. Within each individual group of staff employees, sampling was done after determining the overall population of each category.

Proportionate stratified sampling method was used to establish the study's target sample size. Proportionate stratified sampling involves matching the sample sizes from various strata to the sizes of those strata. To provide a representative sample when the population is not homogeneous, stratified sampling is frequently used [5].

Simple Random sampling was employed to select 115 participants to be interviewed in each stratum represented by respondents from each department, ensuring an appropriate representative sample to be used in making insightful conclusions.

C. Data Collection Methods

During the data collection phase, questionnaires were used to gather both qualitative and quantitative data. Questionnaires can be used by researchers to directly obtain information on the workplace [7]. Additionally, they offer the advantage of ensuring anonymity, which raises response rates. Majority of the questionnaire's questions were closed-ended, and responders were required to fill their responses on a Likert-style scale from 1 to 5 represented by No Extent (NE), Little Extent (LE), Moderate Extent (ME), Large Extent (LE) and Very Large Extent (VLE) respectively.

D. Validity and Reliability

To evaluate the questionnaires' content validity, the questionnaires were evaluated on the questions and feedback was provided on how well they captured the relevant study

variables. All the questionnaire items were thoroughly evaluated by experts to make sure they were concise, thorough, and simple to comprehend. In order to identify the question types utilized in earlier studies and use this knowledge to further improve and improve the questionnaire, this approach was supplemented by an exhaustive empirical examination of the current literature.

The consistency of results received from an instrument is referred to as reliability [4]. For this study, SPSS software was used, and the Cronbach's coefficient alpha of 0.73 with pilot test of 10 participants was used to assess the questionnaire's reliability. This High value denotes that the scale was more reliable.

E. Data Analysis

A vital phase of research is data analysis, which entails looking over and evaluating the information gathered. The data was entered into SPSS Version 28 for this study's preliminary and in-depth analysis. The data was cleaned up and organized throughout the preliminary analysis to guarantee its accuracy and dependability. The integrity of the data was maintained by addressing any missing numbers, outliers, or data entry mistakes. Descriptive statistics was used to undertake a thorough analysis to highlight the important aspects of the data. To give a clear picture of the variables and their distributions, measures like frequencies, percentages and tables were used.

4. Results and Discussion

A. Extent of ERP Automation Across Key Departments

The study sought to find out the extent of ERP system automation across various departments in KMTC. Among the major departments considered were finance, procurement, academics and library services.

Based on the data collected, the extent of automation in the finance department was represented in Table 1 where the finance department reported the highest level of automation at a large extent, with 59 respondents or 51% selecting this option. A very large extent of automation was reported by 18 individuals (15%). Together, these two categories represent over two-thirds of respondents perceiving significant automation in financial processes. Meanwhile, a moderate extent was seen by 27 respondents (24%). Low levels of automation were minimal, with little extent selected by only 8 individuals (7%) and no extent by just 3 respondents (3%).

Considering the question of whether the Academic Department was automated, the respondents provided diverse responses. As shown in Table 1, while a moderate extent of automation was reported by 38 respondents (33%), the highest response was little extent with 45 respondents (39%). Only 9 (8%) and 2 (2%) reported a large extent and a very large extent of automation in the academic department respectively. However, 21 (18%) participants did not believe the academic department was adequately automated.

Regarding the automation of the accommodation department at KMTC, the following analysis can be made from the results.

The majority of respondents reported a moderate extent of automation in the accommodation department, with 44 individuals or 38% selecting this option. A large extent of automation was reported by 35 respondents (30%). Together, these two categories represent over two-thirds of respondents perceiving significant automation in accommodation processes. Little extent was selected by 20 individuals (18%), while no extent and very large extent were the minority responses with 9 (8%) and 7 (6%) respectively.

With respect to procurement department based on the data collected, nearly half of respondents reported a large extent of automation in the procurement department, with 47 individuals or 41% selecting this option. A very large extent was chosen by 21 respondents (18%). Together, these categories represent over half of the responses. A moderate level was perceived by 29 people (25%). Low levels included little extent at 15 (13%) and no extent at only 3 (3%). In total, the automation levels in procurement were assessed from 115 total valid responses received. When viewed against the other departments surveyed, the procurement department seems to have adopted automation rather extensively from the perspectives outlined here.

Pertaining the automation of the library department as shown in Table 1, majority of respondents perceived a moderate extent of automation in library services, with 39 individuals or 33% selecting this option. Close behind was little extent, chosen by 38 respondents (33%). Taken together, these categories represent over two-thirds perceiving some level of automation in library processes. A large extent was reported by 16 people (14%), while no extent and very large extent garnered 18 (16%) and 4 (4%) responses respectively.

B. Extent of ERP Usage in the Departments

ERP system is widely used in many ways in various organizations that have implemented the system. In this study, the focus was to find out the magnitude of use of ERP after automation in accessing and downloading results, accessing and downloading fee statements, booking accommodation online, uploading results online and making and approving financial transactions as presented in the table 2.

Based on the data collected regarding students' ability to access and download their results on the ERP system, the following results were obtained. The majority of respondents,

82 individuals or 71%, reported no extent that students are able to access and download results on the ERP system. A little extent was reported by 20 respondents (17%), while moderate extent garnered 8 responses (7%). Low levels included large extent at 4 (4%) and very large extent at just 1 (1%). When compared against other functions surveyed, it appears the ERP has seen limited application for distribution of student grades according to these findings. Further efforts may be needed to more fully adopt electronic result processing and release utilizing the available technology resources

The following analysis can be made regarding students' ability to access and download their fee statement on the ERP system based on the data collected for analysis. The largest response was little extent, with 30 participants (26%) selecting this option. An additional 30 participants reported a moderate extent (26%). Taken together, over half of respondents perceived some level of access. A large extent was reported by 22 individuals (19%), while no extent garnered 23 responses (20%). Very large extent had 10 participants (9%). Compared to other functions like accessing results, a greater portion of students seem able to utilize the ERP system for their fee information based on these perceptions. However, there may still be opportunities for KMTC to further optimize electronic fee processing and notification utilizing this technology platform.

With reference to students' ability to book their accommodation on the ERP system, the following observations were made. The highest response was no extent, with 53 students (46%) selecting this option. This suggests that for nearly half of respondents, booking accommodation online using the ERP system was not possible. Little extent came in second with 31 students (27%), followed by moderate extent at 17 respondents (15%). Lower levels included large extent with 11 students (10%) and very large extent garnering 3 responses (2%). Compared against other functions surveyed, it appears this capability has seen more limited adoption based on student perceptions captured here. Further optimizing the electronic accommodation process through the ERP may help to improve services as the college works to enhance its digital transformation.

The Head of Department's ability to upload results on the ERP system was also sought, the following analysis insights

Table 1
ERP departmental automation

ERP departmental automation	NE n (%)	LE n (%)	ME n (%)	LE n (%)	VLE n (%)
Academics	21 (8)	45 (39)	38 (33)	9 (8)	2 (2)
Finance	3 (3)	8 (7)	27 (24)	59 (51)	18 (15)
Procurement	3 (3)	15 (13)	29 (25)	47 (41)	21 (18)
Accommodation	9 (8)	20 (18)	44 (38)	35 (30)	7 (6)
Library services	18 (16)	38 (33)	39 (33)	16 (14)	4 (4)

Table 2
ERP usage in service delivery

Statement	NE n (%)	LE n (%)	ME n (%)	LE n (%)	VLE n (%)
Access and download results	82 (71)	20 (17)	8 (7)	4 (4)	1 (1)
Access and download fee statements	23 (20)	30 (26)	30 (26)	22 (19)	10 (9)
Book accommodation online	53 (46)	31 (27)	17 (15)	11 (10)	3 (2)
HODs upload results on the ERP	79 (69)	17 (15)	8 (7)	8 (7)	3 (2)
Financial transactions approval on ERP	12 (10)	26 (23)	29 (25)	26 (23)	22 (19)

were made. The highest response was no extent, with 79 HODs (69%) in agreement on this option. This suggests that for over two-thirds of respondents, uploading results online using the ERP system was not possible. Little extent came in second with 17 HODs (15%), followed jointly by moderate extent and large extent which both had 8 HODs (7%). Very large extent garnered 3 responses (2%).

Finally, the results of the analysis regarding the approval and completion of financial transactions on the ERP system at KMTC were revealed. The highest responses were large extent and little extent, each reported by 26 individuals at 23%. Moderate extent was chosen by 29 respondents (25%). Very large extent garnered 22 responses (19%). No extent was the minority opinion at 12 individuals (10%).

A substantial portion of the sample perceived significant utilization of the system for transaction processing according to these findings. As financial transactions are approved and done on the ERP system, this suggests adequate adoption of the technology platform for core administrative functions so far. However, as with other modules, opportunities may still exist to optimize usage further through ongoing digital transformation efforts.

5. Conclusion

Several conclusions can be drawn based on the above findings and analysis. ERP systems have been adopted to varying extents in key KMTC functions, with room for improved implementation. A direct influence of ERP adoption, particularly for academics and financial functions, on critical institution's performance metrics was established. This implies ERP systems can facilitate achievement of better outcomes if fully optimized.

Overall, it is evident that the finance department appears to have embraced automation solutions to a substantial degree relative to other departments studied, according to the perceptions of the respondent in this study. When compared to other departments, accommodation appears to have a moderate level of automation according to these findings. When viewed against the other departments surveyed, the procurement department seems to have adopted automation rather extensively from the perspective's responses. When viewed alongside automation levels in other KMTC functions, the library services department seems to have implemented ERP systems to a moderate degree based on the results of the analysis.

With regard to usage, it is evident that the ERP has limited application for processing of student results according to these

findings. However, compared to other functions like accessing results, a greater portion of students seem able to utilize the ERP system for their school fees information. In contrast against other functions surveyed, booking accommodation online capability had more limited adoption based on student perceptions captured. The result also reveals a much smaller portion of HODs reluctance to utilize the ERP according to the findings this study. A substantial portion of the sample perceived significant utilization of the system for transaction processing according to these findings. As financial transactions are approved and done on the ERP system, this suggests adequate adoption of the technology platform for core administrative functions so far.

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