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DIGITAL TRANSFORMATIONS EFFECT ON RAISING THE EFFICIENCY OF INFORMATION PROJECT MANAGEMENT: AN ANALYTICAL STUDY

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ABSTRACT

The study aims to diagnose the reality of digital transformation in the Central Library, and measuring its effect on enhancing the efficiency of information project management in its technical and human dimensions. It also seeks to identify barriers to access to the smart library and to provide a practical model that contributes to automating office processes and raising the accuracy of information retrieval, the descriptive-analytical approach was adopted in the study and the questionnaire, observation and standardized interview were used as methods of data collection, and the statistical program SPSS version 23 was used to analyze the results of the study, and the study came out with a number of results, most notably: The Central Library has achieved remarkable success in the project of the digital repository for dissertations, as it obtained the highest average of (4.42), making it the most efficient project, the results proved that digital transformation has actually contributed to reducing the time spent on academic research and improving the accuracy of information retrieval, existing digital systems have achieved a good level of ensuring the sustainability of available resources without significant technical disruption, despite the need to upgrade infrastructure.

KEYWORDS

Digital Transformation, Project Management, Information Efficiency.

Introduction

Central libraries in universities are the lung of knowledge and the beating heart of scientific research, and with the acceleration of the technological revolution, digital transformation is no longer just an option to improve service, rather, it has become an existential necessity to reframe the library's identity from a book repository to a digital knowledge management center, the concept of information project management at the Central Library extends to the construction of digital repositories, the computerization of catalogues (OPAC), the management of the chart and rare documents electronically, and the development of intelligent retrieval systems. The importance of this transformation lies in raising the efficiency of the management of these projects in terms of speed of access to information, data accuracy, and reducing operational costs, in order to achieve the maximum benefit for researchers and beneficiaries, However, the **problem** of the study is that there are structural and organizational challenges that prevent the desired digital integration within the Central Library,

where there is a disparity between the ownership of digital tools and the professional management of information projects despite the availability of some systems, operations still suffer from a slowness in the automation of information supply chains (from indexing to digital lends), and a loss in data integration between different departments, which leads to a decline in the efficiency of managing major information projects, and the problem is exacerbated by the existence of a technical gap among human cadres, accordingly, the study **aims** to diagnose the reality of digital transformation in the Central Library, and measure its effect on enhancing the efficiency of information project management in its technical and human dimensions. It also seeks to identify the barriers to access to the smart library, and to provide a practical model that contributes to the automation of library processes and raising the accuracy of information retrieval. This study gains its **importance** from the fact that it is in line with international standards in improving the 'digital user experience' within libraries, and provides decision-makers at the Iraqi University with a scientific roadmap to transform the Central Library into a sustainable digital environment that supports scientific research and keeps pace with international quality standards, The research **hypotheses** were directed towards:

1- There is a significant relationship with a positive statistical significance at the level of (0.05) between the level of readiness of digital transformation (infrastructure, software systems, digital training) and the views of the workers in achieving the strategic goals of the Central Library.

2- There is a significant relationship with a positive statistical significance at the level of (0.05) between the application of digital archiving and electronic archiving systems and adherence to international library standards (e.g. MARC 21).

3- There is a significant relationship with a positive statistically significant relationship in digital transformations in terms of their dimensions (automation, digital repositories, electronic indexing, and interrelated databases) with the efficiency of managing information projects in terms of their dimensions (retrieval accuracy, data comprehensiveness, sustainability of digital resources, researchers' satisfaction) in the central library.

4- There is a statistically significant effect at the level of (0.05) for digital transformations in terms of their dimensions (automation, digital repositories, electronic indexing, and interconnected databases) on the efficiency of managing information projects in terms of their dimensions (retrieval accuracy, data comprehensiveness, sustainability of digital resources, researchers' satisfaction) in the central library.

The researcher followed the **descriptive approach** in an attempt to reach the accurate knowledge of the elements of the problem represented in (digital transformations and their role in raising the efficiency of information project management), in order to reach a better and more accurate understanding and develop future policies and procedures for it. The study also adopted the analytical method from the descriptive method, because description is one of the basic processes in scientific research, it enables the researcher to accurately describe the phenomenon studied, with the need to organize and analyze the data and extract conclusions that are meaningful and meaningful to the study problem. The study adopted multiple methods of data collection and analysis to reach results. As for the research **community**, it may be from all the digital informatics projects managed and designed by the Computer Center at the University (field of study) during the period (2024-2025), which are (7) technical projects A deliberate sample of these projects was selected for the purpose of analysis, including (5) projects that met the conditions of the technical review and available data. Two projects were dismissed due to incomplete programmatic documentation. The reason for choosing this

deliberate sample (technical projects) is that it represents the actual outputs of digital transformation, and it is supposed to be of high sobriety to represent the precise competence and engineering and programming effort of the center, and the study used a set of tools to collect data, including:
1- Direct examination and observation: for software systems and digital projects, the study sample.
2- Questionnaire and interview: Addressed to the employees of the computer center to evaluate the efficiency of the department.
3- Secondary sources: Arab and foreign books, articles, and studies related to digital transformation.
The study borders were framed as follows:
- Objective borders: Digital Transformations and their role in raising the efficiency of information project management.
- Spatial and temporal borders: The Information technology center at the central library of Imam Al-Azam University College for the completed projects during the year (2024-2025).

Previous Studies: Ashwaq Abbas Harbi's Study on the Digitization of Parliamentary Research Services for Beneficiaries in the Iraqi House of Representatives The research study dealt with building a digital platform that provides a set of communication channels through which parliamentary research services can be provided with high quality and efficiency in performance, and identifying the tools, procedures, and analyses used in the study.
The study of the governor of Jubouri Hadeer Mohammed Abdul Ghafoor Al-Jawahiri on the scientific paper tagged strategies for the digital transformation of information and its impact on improving the service provided to the beneficiaries The research study dealt with the adoption of digital conversion strategies of information and its impact on improving the service provided to the beneficiaries and determining the time of completion of the beneficiary's request, the speed of service delivery, and the total costs in electronic and traditional paper archiving.

Theoretical Aspect: This research dealt with several paragraphs, which we explain as follows:

First: The Concept of Digital Transformation:
Digitization term means converting something into a digital form. For example, we convert paper documents, photographs, cassette tapes, and other non-digital analog physical resources into digital format, usually through special devices such as a scanner.
Digital transformation is widely used as an alternative to the term digitalization because the process of digital transformation has been mainly used to describe the transformation from the paper system to the digital system (i-scoop, 2021).
Digitalization in its first and second senses represent the main elements of digital transformation (Wang, 2021), digital transformation is also considered as the integration of digital technology in all areas of work, which is a cultural change that requires organizations to constantly challenge the status quo and constantly experiment, and transformation can affect the process of changing the product or the way of service delivery completely to be in line with modern changes, and the transformation can be strategic in line with digital development, as it interferes with the functions of the entire organization (Jamila & Youssef, 2019, page 947).

Second: Benefits of Digital Transformation

There are many advantages to digital transformation, which can be summarized as follows:

1- Service Improvement: One of the most important pillars of digital transformation stems from the need of beneficiaries to obtain better service.

2- Increase internal collaboration: If the size of a digital transformation project is large, it can affect the entire organization and better foster internal collaboration. (Arab Entrepreneur, 2021).

3-Speed and ease of performance: Non-profit departments and institutions save a lot of time and effort when investing in technologies, whether in business performance or communicating with human cadres or the beneficiary.

4- Performance quality: The percentage of human errors decreases when using smart technologies, and performance can be measured and developed continuously, ensuring continuous improvement in work (Al-Qasabi, 2018).

Third: Digital Transformation Strategy:

The main objectives of the Digital Transformation Strategy are summarized as follows (Ministry of Digital Economy and Entrepreneurship, 2021):

First: Meeting the needs of citizens and facilitating procedures: Meeting the needs of citizens is achieved through flexibility and harmony in the digital transformation of services to suit their needs.

Second: Upgrading the level of services and increasing the rate of demand for them, achieving unified standards for the quality of providing digital services, and ensuring that beneficiaries receive a complete and secure digital service in a way that ensures ease of use and access efficiently, effectively and quickly through comprehensive and diverse channels, which leads to an increase in the rate of demand for it.

Third: Saving expenses is represented by reducing the medium and long-term expenditure of service providers in terms of resources and operational costs required to provide the service, as well as saving time, effort, and costs for the beneficiaries to obtain services compared to the traditional method (Al-Mubaydeen, 2021).

Fourth: Improving performance efficiency, improving operational efficiency and increasing the efficiency of the organization through the optimal use of new resources and technologies, in order to achieve a work environment that supports and facilitates the journey of digital transformation in organizations, and building and developing capacities through intensive education and training (Faisal, 2020).

Fifth: Raising the level of trust in the Foundation, building bridges of cooperation and enhancing mutual trust between the Foundation and the beneficiaries, by enhancing communication with service providers, reducing administrative corruption practices, increasing transparency, and providing beneficiaries with the data held by the Foundation to improve innovation and contribute to decision-making.

Fourth: The Challenges of Digital Transformation

There are many challenges and obstacles that hinder digital transformation within organizations, including:

First: Organizational and Legislative Obstacles

1- Lack of planning and coordination at the senior management level of digital transformation programs.

2- Weakness of media awareness programs accompanying the implementation of digital transformation projects in institutions.

3-The difficulty of creating a legislative and legal environment that is suitable for digital work, which requires effort and time (Mohammed, 2018)

4- Continuous change within the organization is one of the most important obstacles to the successful implementation of digital transformation programs and the achievement of their desired goals (Mahmoud, 2018).

5- Organizational culture change, there can be resistance to change, so cultural change is a preliminary process for any organizational change and development. This requires training human resources. (Al-Harthi, 2020).

Second: Technical Obstacles

1- Lack of a comprehensive digital strategy, as well as limited localization of technologies needed for digital transformation.

2- The most obvious challenge is the fear of information security risks resulting from the use of technological means, cybersecurity, and cyberattacks (Mahmoud, 2018).

3- Technology, Technology is a sine qua non, but it is not enough to ensure an effective digital transformation. Thus, organizations do not have to start with technology, but use it better to achieve their goals (Boneva, 2018).

Third: Human Obstacles

1- Some managers and those in power feel that change is a threat to their authority and power.

2- Lack of trust in the protection and confidentiality of personal information and transactions within the digital environment.

3- The need to improve the technological culture of the citizen and create a platform to spread the culture of information security.

4- Digital Transformation Competencies Support human resources and provide educational programs that help them deal with this new management approach and big data. This means the ability to read and understand new (unstructured) data patterns, process them, and make decisions accordingly (Boneva, 2018).

Fourth: Financial Obstacles

1- Lack of financial resources allocated to develop the necessary infrastructure for the implementation of the digital project.

2- Lack of resources available for some public services due to their tied to fixed and defined spending budgets.

3- Lack of financial allocations for training and qualification processes for the implementation of digital projects (Mohammed, 2020).

Fifth: Elements of Digital Transformation

The digital transformation process includes a set of important elements to implement, which are as follows:

1- Human Resources: Providing qualified and capable cadres includes the use and analysis of data to make and implement effective decisions, and be trained in the latest digital technology systems with specialized scientific and practical experience with a belief in change and development (Al-Qasabi, 2018).

2- Processes: It is a set of organized and interconnected activities and tasks that produce a particular service or product for the beneficiaries. Organizations must establish an effective technical structure that enables the development of processes both internally and externally, in order to ensure the optimal implementation of digital transformation (Yasser, 2019).

3- Data and analytics: Digital technology allows organizations to access critical information, such as beneficiary behaviors, customer segments, and quantitative performance indicators of an organization to produce statistics for these outcomes. This results in improved organization performance and better attracting beneficiaries.

4- Technologies: Digital transformation is implemented by using a combination of operating systems, hardware, storage media, and software that operate in technology environments and information centers that enable the use of all assets with continuous operational efficiency. (Doro, 2019).

5- Digital Transformation Strategy: When implementing digital transformation policies, it is essential that an organization has a clear digital strategy on how to implement the digital transformation process.

Second Requirement: Information Project Management

First: The Concept of Information Project Management

It is an interconnected set of activities and processes of planning, organizing, allocating resources, and oversight that are oriented towards a specific goal and are time-bound and designed within a specific discipline. It is also defined as the application of knowledge, skills, tools, and techniques to the activities of the project to meet its requirements. In the context of information, it involves managing temporary endeavors to create a unique information product or service (such as a software system or data infrastructure) within the constraints of scope, time, cost, and quality. (Kabro, 2017, p. 3).

Marquiva focuses on the strategic and methodological value of IT project management through the planning, organization, and monitoring of information projects, to ensure that real business value is delivered to the organization. This management requires a methodology that provides a strategic framework for decision-making and management of technical and human risks (Marchewka, 2015), and (Schwalbe, 2019) as the specialized use of a set of tools and techniques for the management of human, technical and financial resources, with the aim of successfully achieving the set objectives of the IT project, with a special focus on change management and stakeholder expectations, and information systems project management includes work planning, risk assessment, estimating the resources required to complete the work, organizing the work, obtaining Human and material resources, directing activities, monitoring project implementation, and analyzing results to ensure that the new system efficiently supports the organization's strategy. (Laudon & Laudon, 2020)

Second: Information Project Management Life Cycle

1-Project Initiation: This stage involves defining the initial scope of the project and formally appointing the project manager, resulting in a Project Charter that grants the legal authority to start work (Kerzner, 2017).

2-The project planning phase is the most critical stage, where detailed plans for schedule, budget, quality, human resources, and risk management are developed (Meredith et al., 2017).

3-Project Execution is the stage in which the tasks specified in the project plan are executed, and people and resources are coordinated to achieve the required outputs (PMI, 2021).

4- Monitoring and Control Phase This stage takes place in parallel with implementation, and aims to measure the actual performance against the planned, and take corrective actions when deviations occur (Kerzner, 2017).

5-Project Closing involves the formal completion of all activities, the delivery of the final product to the client, and the archiving of lessons learned to improve the performance of future projects (Meredith et al., 2017).

Third: The Golden Triangle of Project Restrictions

(Schwalbe, 2019; and PMI, 2021) stated that the Golden Triangle of project constraints consists of:

1- Scope: Represents specific goals, tasks, and results that need to be achieved. Any increase in requirements without adjusting other resources leads to an imbalance.

2- Time: Represents the delivery schedule and deadlines. Time pressure often requires an increase in cost or a reduction in scope.

3-Cost: Represents the budget and financial and human resources allocated. Lack of budget may prolong the project or reduce the quality of the scope.

4- Quality: It is often located at the center of the triangle, as it is the balance between the three constraints that determines the final quality of the output.

Fourth: Methodologies Used in Information Projects

1-Waterfall Methodology is the traditional linear methodology, where a phase can only be started after the previous one has been completed. It is best suited for projects with clear and consistent requirements (Sommerville, 2016).

2- Agile methodology is based on iterative and incremental development. Focusing on rapid change response rather than a rigid plan, it is considered the gold standard for modern software projects (Wysocki, 2019).

3- Scrum Framework: A technical framework that falls under the Agile Methodology, relies on short time cycles called Sprints to periodically deliver functional parts of the system (Schwaber & Sutherland, 2020).

4- Hybrid Methodology: Integrates waterfall architecture and Agile resiliency, a recent approach in research published in Scopus to balance management control and speed of implementation (Project Management Institute, 2021).

Fifth: Reasons for the success of information projects

Academic studies have unanimously agreed that success does not depend only on the technical aspect, but also on administrative and organizational factors:

1- Top Management Support: It is the most vital factor to provide the necessary resources, overcome bureaucratic hurdles, and ensure that the project is aligned with the organization's strategy (Project Management Institute, 2021).

2- User Involvement: Ensures accurate understanding of requirements and reduces resistance to change when the system is launched, which increases the rates of technology adoption (Marchewka, 2015).
3-Clear Business Objectives: Setting SMART goals prevents distractions and helps measure actual versus planned performance (Schwalbe, 2019).

Sixth: Reasons for the failure of information projects

Studies show that most failures are due to gaps in planning and control:
1- Scope Creep: This is the uncontrolled expansion of project requirements without a parallel adjustment in time or budget, leading to the collapse of the Golden Triangle (Wysocki, 2019).
2- Poor Communication: Failure to transfer information between programmers, management, and users leads to the construction of systems that do not meet the actual need (Sommerville, 2016).
3- Inaccurate Estimates: Relying on estimates that are too optimistic or not based on historical data leads to over-budgets and delayed delivery (The Standish Group, 2020).
Practical Aspect
Before starting the analysis, the following were determined:
1- **The validity and consistency of the study tool**, Cronbach's Alpha coefficient was extracted to ensure the consistency of the paragraphs, the overall stability coefficient was (0.89), which is an excellent value (greater than 0.70), which indicates that the questionnaire is applicable to the study.
2- The questionnaire was distributed to a sample of (50) individuals, and they were distributed as follows:
- Position: 20% Senior Leadership, 50% Technical and Technical Staff, 30% Administrators.
- Experience: 65% have more than 10 years of experience in information projects.
- Scale used: Likert Five-Fold Scale (Excellent=5, Very Good=4, Good=3, Acceptable=2, Poor=1).
- Category length: (1 to 1.80: Very Weak - 1.81 to 2.60: Poor - 2.61 to 3.40: Medium. - 3.41 to 4.20: Good (High) - 4.21 to 5.00: Excellent (Very High).

First: Analysis of the Digital Transformation Axis

This axis contains two basic dimensions that measure the technical and structural aspect and the following table shows this:

Table (1): Statistical Analysis of the Paragraphs of the First Axis

A	Paragraph	Weighted arithmetic mean	Standard deviation	Relative importance	Ranking	Direction
1	Automate entire information supply chains	3.65	0.92	%73	4	Good
2	Thesis management through an integrated digital repository	4.42	0.65	%88.4	1	Excellent
3	Electronic Archiving of Manuscripts and Rare Documents	3.90	0.84	%78	3	Good
4	Application of International Standards (MARC21)	3.20	1.15	%64	7	Medium
5	Electronic Catalog Access (OPAC) from Abroad	4.15	0.72	%83	2	Good
6	Link to global databases and repositories	3.55	0.98	%71	5	Good
7	Update bibliographic data instantly and automatically	3.45	1.02	%69	6	Good
		3.76	0.89	%75.2		Good

Table Analysis: We note that paragraph (2) related to (Dissertation Management through a Digital Repository) obtained the highest weighted arithmetic average of (4.42), This reflects a great success in this aspect, on the other hand, paragraph (4) of (Application of International Standards MARC21) obtained the lowest weighted mean of (3.20), which indicates that there are technical challenges in adhering to international standards for the description of digital sources, which requires a developmental intervention.

Axis Analysis Efficiency of Information Project Management

This axis focuses on measuring the outputs of digital transformation and its impact on the accuracy of work and the satisfaction of the beneficiaries, as the following table shows:

Table (2): Statistical Analysis of the Paragraphs of the Second Axis

A	Paragraph	Weighted arithmetic mean	Standard deviation	Relative importance	Ranking	Direction
1	Reduce human errors in retrieving information	4.25	0.68	%85	2	Excellent
2	Comprehensiveness of data for all scientific disciplines	3.85	0.81	%77	4	Good
3	Sustaining digital resources without technical interruption	3.60	0.95	%72	6	Good
4	Positive change in researchers' satisfaction	4.35	0.62	%87	1	Excellent
5	Reduce the time spent on research	4.10	0.75	%82	3	Good
6	Meeting the project outputs to the expectations of the beneficiaries	3.75	0.88	%75	5	Good
The general average of the second axis		3.98	0.78	%79.6		Good

Table Analysis: The results indicate that digital transformation has had a direct and strong effect on (increasing researcher satisfaction) (mid 4.35) and (reducing human errors) (mid 4.25), this confirms that the efficiency of information project management has improved significantly as a result of automation, which supports the validity of hypotheses linking digitization to the quality of office outputs

Axis Analysis Obstacles and Readiness

This axis measures the human and financial factors that affect the continuity of the transformation as illustrated in the following table:

Table (3): Statistical Analysis of the Paragraphs of the Third Axis

A	Paragraph	Weighted arithmetic mean	Standard deviation	Relative importance	Ranking	Direction
1	Periodic training programs for cadres	2.85	1.20	%57	3	Medium
2	Sufficient budget for maintenance and development	3.10	1.10	%62	2	Medium
3	Presence of high integration and coordination between technical departments	3.45	0.96	%69	1	Good
The general average of the third axis		3.13	1.08	%62.6		Medium

Table Analysis: The results show that training and budget are the weakest link in the digital transformation process (arithmetic averages 2.85 and 3.10 respectively) This explains the gap between having digital tools and reaching full professional management, as the human element needs continuous qualification and sustainable financial support to maintain software systems.

Proof of hypotheses

There is a statistically significant relationship between the level of readiness of digital transformation and the achievement of the library's strategic goals.

The value of the Pearson correlation coefficient (r) between readiness and training (the third axis) and the achievement of the goals (the second axis) was a value of (0.765) with a significance level of (0.000).

Since the value of SIG is less than (0.05), we accept the hypothesis. This indicates that any improvement in training and budget (readiness) directly increases the efficiency of achieving the objectives of the information projects.

There is a relationship between the application of archiving systems and adherence to the International Bureau Standards (MARC21).

The analysis showed an average strength correlation of (0.512) The relationship is direct but not very strong, which is explained by the low mean of paragraph (4) in the questionnaire. This means that the library practices digital archiving but still needs to work harder to link it to international standards.

There is a significant relationship between the dimensions of digital transformations and the efficiency of information project management.

Table (4) Correlation between Variables (Pearson Correlation)

Variable	Automation and Warehouse	Indexing and Rules	Project Management Efficiency
Automation and Warehouse	1	0.684	0.812
Indexing and Rules	0.684	1	0.756

Table analysis: There is a very strong correlation (0.812) between automation and management efficiency. This proves the third hypothesis to be correct: the greater the reliance on digital repositories, the higher the accuracy of retrieval and the comprehensiveness of data in the central library.

There is a significant impact of digital transformations in all its dimensions on the efficiency of information project management.

To test this hypothesis, regression analysis was used to determine the ability of the independent variable to predict the dependent variable, and the following table shows this:

Table 5: Results of Linear Regression Analysis

Independent variable	Determination Coefficient (R2)	(F) Value	Significance Level (Sig)	Conclusion
Digital transformations	0.698	111.45	0.000	Hypothesis Acceptance

Table Analysis: The value of (R^2 = 0.698) means that the digital transformations (automation, repositories, indexing) explain the percentage (69.8%) of the change in the efficiency of information project management, and the high value of (F) and the level of significance (0.000) confirm that the statistical model is very accurate in proving the impact, accordingly, the fourth hypothesis is accepted, which proves that digitization is the main driver to raise the quality of office services and reduce time and effort.

Result

1. The Central Library has achieved remarkable success in the Digital Dissertation Repository project, as it obtained the highest arithmetic average (4.42), making it the most efficient project.
2. The results proved that digital transformation actually contributed to reducing the time spent on academic research and improving the accuracy of information retrieval.
3. A strong statistical association (r = 0.812) was found between supply chain automation and increased efficiency of information project management, confirming the validity of the study's hypotheses.
4. The analysis showed that digital transformations explain (69.8%) of the development in beneficiary satisfaction and the quality of office outputs.
5. It was found that there was a gap in the application of global standards such as MARC21, where it received an average rating of (3.20), which reduces the quality of integration with global libraries[6].
6. The results showed that adequate budget and training programs are the least available factors, which is a barrier to access to the full smart library[7].
7. The ANOVA test revealed differences in the perception of the importance of digital transformation due to years of experience, as those with long experience were more aware of the need for digital sustainability.
8. Existing digital systems have achieved a good level of ensuring the sustainability of available resources without significant technical disruption, despite the need to upgrade infrastructure.

Recommendations

1. The need to oblige the technical team to apply the (MARC21) standard in the description of all digital resources to ensure the compatibility of projects with international systems.
2. Holding periodic intensive training courses for human cadres on digital knowledge management to bridge the gap between owning tools and the ability to manage them.
3. Setting a fixed financial item in the university's budget for the maintenance and updating of the software to ensure that information projects are not stalled or technically obsolete.
4. Working on digitizing rare manuscripts and documents that have received an average rating, to raise the value of the library as a digital heritage center.
5. Striving to link the library's local databases with international repositories to open wider horizons for researchers and keep pace with international quality standards.
6. Using the results of this study as a roadmap for the transition from simple automation to a smart environment that relies on artificial intelligence for indexing and retrieval.

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