

# Establishing and Designing the Financial System for the Research Program of the Deanship of Scientific Research at Northern Border University

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## Summary

The study aimed to realize one of the basic requirements for designing and building the integrated automated system for scientific research at Northern Border University, which includes the establishment of an automated interconnected system to manage all academic and financial operations of scientific research. From receiving the budget of the funded research courses, then the regular financial regulation of all the research team's rewards, the cost of publishing, translation and equipment, then receiving the research plans and linking them financially, preparing the total and detailed financial value for all stages, then financial disbursement operations, financial closure of research when published, and preparing financial reports. The research team used the analytical approach to build the main and subsidiary requirements for designing the financial system, and the study concluded that all the elements required for the stages of financial management for scientific research at Northern Border University can be met based on sufficient by sequencing these processes and how they are sequenced as it is designed in the research study.

**Keywords:** *scientific research; integrated automated systems; financial automated systems; financial systems for scientific research; Northern Border University.*

## 1. Introduction

Research institutions are an important part of the university entity, as they share the general strategic goals with them, and are interested in providing the university's employees with information sources of all kinds. Higher education and scientific research movement, Because of the rapid progress in the flow of information, and the increase in the number of research in various disciplines [1], it has become imperative for universities to strive towards achieving their development and strategic goals at all levels, However, these development goals are achieved within an integrated set of goals that push the development axis, and scientific research and development plays a key role in the

prosperity of the knowledge research and development system, This is done through extensive coordination between universities and scientific institutions to rely on the capabilities of scientific and technological universities in order to identify the requirements and societal needs in order to identify clear research paths to contribute to its advancement [2], With allocating the necessary resources to provide the appropriate laboratory equipment and scientific equipment needed by the research team for scientific creativity and the development, enrichment, sharing and dissemination of human knowledge, The available publication in the approved information observatories and databases is one of the indicators of quality and classification of universities, and a major financial source for financing the needs of universities through grants, grants and research chairs, or through the funded support that they need to contribute to solving scientific achievements, and marketing products locally and globally, in addition to assigning its employees to academic staff, assistants, graduate students, undergraduate students [3], and administrators, to form distinguished research teams, The application of automated information systems technology in universities is one of the necessary tools that achieve the added value of universities [4], which universities are currently applying in order to make maximum use of the possibilities associated with the performance of work, through an integrated set of procedures using available resources, and continuous training of workers to operate and manage integrated automated systems [5,6].

## 2. Study importance

The study establishes an integrated electronic design for managing the financial operations of scientific research at Northern Border University, which meets all the needs of researchers as well as the needs of the university in managing all financial stages related to scientific research,

and includes the processes of initial assessment of the proposed budget, and financial distribution in accordance with the regulations governing scientific research in universities. Saudi Arabia, as well as the rewards of the research, assistant and consultant team, devices, the cost of publishing and translation, as well as the stages of disbursement through an electronic system for financial transfer, and the regular termination of contracts after their publication, receipt of financial documents, and all associated forms, with linking all operations to the appropriate powers of each of the university's employees.

### 3. Study Objectives

The current study aims to design the automated system for scientific research management at Northern Border University and to determine the extent of integration and interdependence of all its elements and components while meeting the actual needs of the university and the research team, in terms of evaluating the ease of use, data inclusion, needs integration, availability of the technological basis for servers and software, with the availability of the system on an integrated series of basic and necessary units, namely:

- Receipt of the budget allocated to the research courses.
- Submitting research proposals, including the initial estimated budget.
- Managing the financial operations of research at the university, including the total financial accreditation and the financial distribution of rewards.
- Distribution of the financial value of translation, publishing and equipment items.
- Managing the subsequent financial management operations of financial disbursement and follow-up of the disbursement of financial payments.
- Detailed reports for each research separately and the issuance of various reports.
- Distribution of financial exchange credits to university employees.
- Follow-up exchange for different research courses.

### 4. Methodology

In order to accomplish this research, the research team used the analytical study method, by monitoring the current phenomenon of the need to design an integrated financial system to manage scientific research operations at Northern Border University, with the use of scientific analysis of all necessary processes for managing financial affairs and the components of the elements required for the stages of receiving the budget. The initial estimate of the budget, financial operations such as rewards, translation costs, publishing and equipment, preparing the pages and items

required for each procedure, designing the accreditation allocated to the university's employees.

### 5. Study Problem

Due to the lack of an integrated automated system for managing the financial operations of scientific research at Northern Border University, the problem of the study stems from the fact that it establishes an integrated design for the financial management processes of scientific research at Northern Border University, which is an emerging university that lacks such integrated automated systems, and it also needs to link all the financial operations are under central management, and coordinate with the university's financial units, as well as the university's internal and external audit offices.

Where information systems and their various tools have become the basic technological base for launching the field of financial operations management for research at Northern Border University, if effectiveness is the most comprehensive and common indicator in evaluating institutional performance, it is a multifaceted phenomenon and one of the important indicators to measure the extent to which the organization achieves its goals within the framework of the environment. In which integrated automated systems operate, and effectiveness is used in performance measurement due to the fact that it takes the multiple dimensions of performance, the most important of which are: achieving goals, improving internal processes, obtaining resources.

### 6. Study questions

The study seeks to answer the following main question:

- What is the effective design of the automated financial system to manage all operations necessary for scientific research at Northern Border University.

The main question includes the following sub-questions:

- What are the determinants and scope of financial operations required for scientific research operations?
- What are the requirements for each stage of the automated system process?
- How is the logical connection of financial operations done automatically based on the end of each stage?
- What are the elements of each requirement and its financial value, according to the regulations governing scientific research for Saudi universities?
- What are the stages of receiving financial files and forms for each stage?
- How are the stages of accreditation carried out by the different holders of authority to manage each stage?

What are the components of the elements of financial recovery, preparing statements for financial

disbursement, following up on defaulters for publication, issuing reports and closing researches?

## 7. Terminology

### 7.1 Research Institutions:

One of the entities affiliated to more comprehensive bodies such as universities, ministries and research bodies, whether affiliated to governmental or private agencies, where research institutions seek to promote the movement and progress of scientific research through a series of procedures, and the integrated automated systems for managing scientific research are one of the important possibilities for these research institutions [7].

### 7.2 Management Information System

A group of interconnected and interrelated elements, which work to integrate various types of data and information, and to process, store, broadcast, distribute and share it to a multi-user group for an orderly management of operations and procedures, the financial information system consists of a traditional form based on handwritten information, and may depend on some simple equipment, equipment and devices and the application of technology in specific stages in order to work on procedures for dealing with data and information, and the automated system consists of a series of hardware and software components. The occasion is in addition to the human element trained to manage those relationships [8].

## 8. Automated information systems

Automated information systems are a means of moving from knowledge based on information management in a paper form to integrated automated processing of the stages

of data receiving, processing, storing, making available, distributing and sharing them in a way, depending on artificial intelligence technology and modern programs and applications [9].

Databases are the backbone of automated information systems, as they keep the human balance of data and information and provide it to the beneficiaries as quickly as possible, and with a huge amount of storage capacity, and they are an organized group of blocks and files that include a huge amount of data that is organized and processed according to specific applications and technical systems, it includes the data that the organization maintains internally and externally [10], and the databases are managed through an interconnected set of advanced software packages, to preserve and share its resources, within the framework of the ability to protect data and maintain its confidentiality [11].

Databases depend on an interconnected group of workers, both when creating and designing systems, as well as when operating. The first category works on creating, designing and analyzing the integrated automated system, its operation and maintenance, [12] and it includes designers, programmers, developers, network engineers, protection and electronic security managers, and the second category is the category of users who manage the system is permanent, in addition to providing all forms of components and physical media such as computers, servers, operating devices, and storage [13], with all communication networks needed by automated information systems, and a set of software necessary for operation and protection, which includes hardware management programs for computers, and auxiliary application software for automated systems [14].

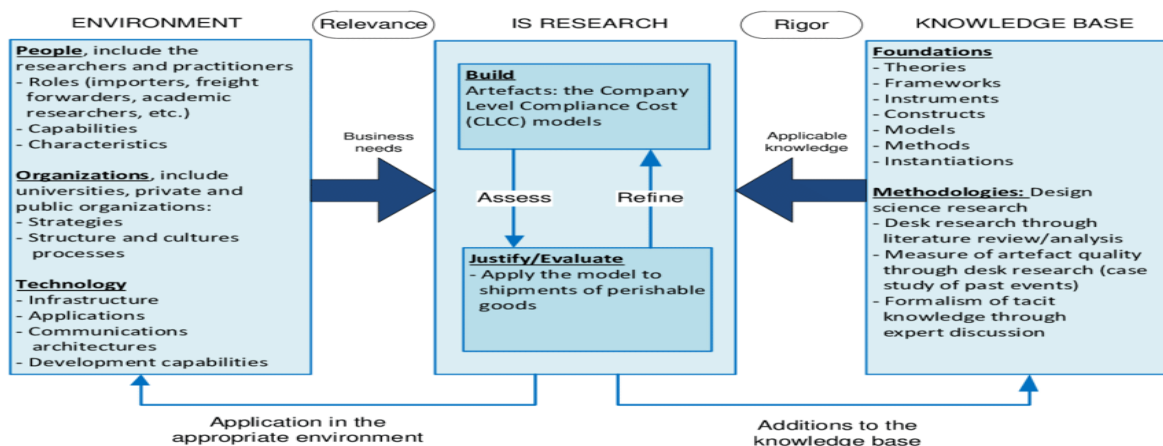


Figure (1): Financial automation system for research

## 9. Requirements and procedures for the financial automation system for scientific research

### 9.1 The phase of approving the budget allocated to the research courses

At this stage, the budget allocated for scientific research for the research cycle is approved according to the financial year, and based on this budget, the equitable distribution of financial resources to the university's requirements according to the faculties and scientific departments, and there is a keenness to balance the numbers of faculty members, and the university's research priorities in accordance with the requirements of society and the strategy plan, how the budget covers all major thematic areas.

### 9.2 The financial submission for the research proposal

The researchers at the university submit a first research proposal that includes the research plan, as well as the expected budget for the completion of the research project. The proposed budget from researchers covers the following aspects:

Researchers rewards.

- Bonuses for assistances.
- Consultants bonuses.
- Costs of translation, computer services, and publishing.
- Costs of tools, equipment and statistical services.

The financial estimation of the financial cost depends on the regulations governing scientific research in Saudi universities as an organizational and financial basis for estimating the financial values.

### 9.3 Preparing the total and detailed budget

At this stage, the research proposals submitted by researchers are discussed and reviewed according to priorities, and the value of the detailed contracts for all research submitted in the research cycle is estimated, with an estimate of the final cost of the budget for research contracts associated with the research cycle, and this is done automatically by approving the total value of each contract in addition to all contracts through this stage, a detailed financial estimate can be made according to the researchers, as well as assistants, consultants, publication cost, translation cost, statistics cost, tools and equipment.

### 9.4 Financial disbursement of the initial contract clauses

Based on the financial appropriation of the budget and the signing of contracts between the research team and the university, the terms and conditions in the contract are implemented, by disbursing introductory payments, often covering the stage of costs for computer services, translation, statistics, publishing, and laboratory experiments, and these terms are among the operational

aspects that are disbursed in the first stage to complete the research, and the funds are disbursed from the university's account to the account of the principal researcher as he is responsible for managing the contract on behalf of the research team. Once the financial disbursement, the contract becomes activated and ready between the two parties to implement the research project.

### 9.5 Financially canceling contracts, transferring responsibility

At this stage, the process of canceling or transferring responsibility for the completion of the research project takes place at the request of the research team, due to the inability to complete the research project, or the existence of emergency conditions that prevent the continuation of the research, where a letter is sent from the principal researcher to the university containing his desire to cancel the contract, or transfer the academic and financial responsibility for managing the contract, and upon approval of this cancellation request, the principal investigator returns the money spent in the first installment through the university's account, and thus this cancellation is implemented.

In the event that the research team wishes to transfer the academic and financial responsibility to the research department without canceling the contract, the treatment is carried out under the following points:

- Transferring the academic and financial responsibility to a third party to manage the research project, with the value of the first payment being returned from the principal investigator, and upon completion of the research project, all the financial contract value is disbursed to the research team.
- Transferring the full academic and financial responsibility to third parties to manage the research project without the value of the first payment being returned to the research project.
- Refund of the financial amounts for the value of the first payment for the research project without canceling the research project, while the contract between the university and the research team continues unchanged, and upon completion of the research project, the full value of the contract is disbursed.

### 9.6 Receiving financial documents

Upon completion of the research project (acceptance letter - publication), the financial documents are automatically uploaded through the automated system from the research team in accordance with the terms of

the contract on a page dedicated to the financial system, which includes:

- Receipt vouchers.
- Financial team signatures.
- Financial report
- Related Invoices according of (translation - statistics - publication - tools - equipment - laboratory cost).

### 9.7 Disbursement of financial dues

As soon as the research team delivers the academic and financial documents, and upon final approval by the university by closing the published contract, the rest of the contract terms, which include all the remaining financial dues, are disbursed through the financial system to the account of the principal investigator or other beneficiaries in accordance with the terms of the contract.

### 9.8 Financial reporting

Through the financial system, the system administrator or the people who manage the financial affairs can prepare detailed and various reports on financial transactions, including:

- Annual budget reports.
- Reports of the value of contracts for the research session.
- Financial reports related to researchers.
- Financial performance evaluation reports.
- Reports of expenses and expenditures broken down in time.
- Internal and external financial audit reports distributed annually.

### 9.9 Follow-up, maintenance, updating and performance evaluation phase

This stage includes following up the operation of the automated financial system, with efficiency and continuity, in addition to evaluating the return it achieves in terms of saving effort, accuracy and speed of achievement, while achieving the goals of the institution according to the needs, with an integrated evaluation of the effectiveness of the automated system that includes the extent of the university's ability to achieve strategic goals, and the extent of operations Securing data and the ability to save and retrieve it for all parties, and then face any problems related to the system and maintain it on an ongoing basis, with the ability to update the required according to the future requirements of the procedures and needs at the university.

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