Digital governance: Towards a successful digital transformation of Moroccan universities

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Abstract

This work is concerned with the issue of digital governance of Moroccan universities, by focusing on some experiences that have dealt with the subject of the digital transformation of universities, for example the MISSION, RECET and AGENT project.

After the presentation of the experience of the MISSION project, we focus on the usefulness of setting up a digital workspace, the formalization of procedures and the definition of key performance indicators as support tools for improving the digital governance of universities. The conclusion sheds light on the successful digital transformation of Moroccan universities, which must not be done without the establishment of a specific framework of analysis and an appropriate organizational structure.

***Keywords— Digital transformation, digital governance, academical, information system, digital workspace, KPI*.**

I. INTRODUCTION

The digitization of society is now a reality; no sector is left out of this transformation, including universities, which include new information formats, new modes of communication and more demanding users.

In this new context, information governance processes form a critical bridge between the systems inherited from the past and the agile platforms of the future. [1].

In 1987, Nobel laureate in economics Robert Solow pointed out that the massive introduction of computers into the economy, contrary to expectations, did not translate into a statistical increase in productivity [2]. To recap, technological developments and the implementation of new tools would not be enough to achieve the strategic objectives of an organizational being.

An information system (IS) is an organized set of resources that collect, store, process and distribute information, it is a socio-technical system made up of two sub-systems, social and technical:

- The social subsystem is made up of the organizational structure and people linked to the IS.
- The technical subsystem is made up of the technologies (hardware, software and telecommunications equipment) and business processes (business blocks) concerned by the IS.

In the technical subsystem, we consider the IT or computer system, which is the set of hardware and software assets of the organization intended to automate the processing of information. This is the visible part that everyone thinks of when it comes to IT projects.

In this work, we consider the following three axes:

- Organizational structure.
- Computer system.
- The Business process.

To ensure the development of the information system, we need to evaluate the existing system in universities.

Generally, the dimensions to be considered in the evaluation of the operation of an information system are the following: the quality of the processes used in an organization, the quality of the artefacts generated during the development, the quality of the data and, finally , the quality perceived by the end user [3] [4].

In the first section of this document, we will focus on harnessing the benefits of the MISSION project [5]. Its main objective was the implementation of a national operational information system service

for Moroccan universities. Subsequently, we will deal with the point of support for improving the governance of universities by setting up a digital workspace, which must be based on a clear formulation of procedures and a determination of Key Performance Indicators (KPIs). In this sense, I will describe the experience of Hassan First University in the "Scientific Research" business process.

To conclude, we will propose questions whose answers can help improve the digital governance of universities.

II. TEMPUS MISSION 2012-2015 PROJECT EXPERIENCE

A. Project overview

Hassan First University launched in 2012 a project for the implementation of a national operational information system service (MISSION), this project, cofunded by the European Commission under the reference [530495-TEMPUS-1 - 2012-1-MA-TEMPUS-SMGR], aimed at modernizing the governance of 14 Moroccan universities (currently 12 after the merger of 2 universities). More specifically, the MISSION project aimed to provide each Moroccan university with an SSIO Operational Information System Service using an Integrated Management Software (An open-source ERP) and managing 4 business process (students affairs, Finance, Heritage and HRM) plus the “Scientific Research” business process.

It should be noted that alongside the improvement of governance, the Information System Service has planned to help the development of the University's missions in terms of teaching and research.

We usually distinguish:

- Operational processes (realization);
- Support processes (support or resources);
- Steering processes (management or decision-making);
- Measurement (outcome evaluation) processes.

Operational processes are at the heart of the business of organizations: Management of student registrations for example. The support processes symbolize the activity of mobilizing the means necessary to carry out operational processes: For example, support for training. The management processes reflect the activity of the information design allowing the activity to be managed: For example, monitoring the management of registrations. The measurement processes allowing the control of the differences between the results and the defined objectives. These measures allow continuous improvement of the processes.

The first deliverable of the project was the development of a master plan for the university information system distinguishing between the business processes of the University Presidency (strategic management) and institutions (operational management).

The motivations that encouraged the adoption of a master plan are:

- Maintain the link between genaral strategy and IS strategy.
- Prioritize IT investments according to the value brought.
- Find the balance between transparency and operational efficiency.

B. Discussion :

The fallout from the implementation of the information system should be felt on the way in which the business process are managed and on the administrative staff. But the non-exploitation of the benefits of the project hampered the improvement of the quality of information and its management. The governance aspect is therefore at the heart of the problem [6].

Digital governance concerns the development and initiation of projects related to digital activities on the one hand, and the management of information systems and the use of digital technology at the University on the other. It must be based on a digital device, a Digital Workspace, this aspect will be dealt with in the next section.

III. DIGITAL WORKSPACE

An digital workspace is a global digital information and communication system that must support personal and professional activity within a work community, which makes it possible, among other things, to:

- Modernize the services offered to users of digital services.
- Familiarize users with the uses of technologies, which not only allow them to learn better but also to better understand the knowledge society in which they will have to take place.
- Make it possible for everyone to demand alternative forms of teaching and learning.

A. The existing Digital Workspace: Case of Hassan First University

Hassan First University provides its students with an digital workspace synchronizing with the APOGEE information system (Application for the Organization and Management of Student Education) to provide students with a detailed view of their university course. This space is not used much, for the main reason is that each institution seeks to provide its students with specific tools.

Another point to consider is that the University's digital workspace targets students only, without considering other electronic services and resources, except news in sync with the web server.

This tool was used during the spring semester of the 2017/2018 academic year. Below are screenshots from the current digital workspace at Hassan First University.

After accessing their profile, the “my file” menu offers the student the possibility of consulting their marital status, addresses, registrations and grades and results: http://ent.uh1.ac.ma/uPortal/login.

B. Why an digital workspace in universitie ?

An digital workspace can be seen as a personalized device offering any authenticated user:

- A device that promotes, (re) creates social ties
  - between students

- between students and teachers
- between teachers
- within and with the administration

- A system in line with current uses of information and communication within the scientific community.
- A system in line with current uses for the production of digital resources and services.
- A system in line with the individual and collective practices of the "internet generation": social networks, Facebook, twitter, YouTube…

C. The issues to consider

The deployment of an digital workspace within a teaching and research community must be based on the prior modernization of the information and communication system. This is a condition for the good governance of the services offered to users, their quality and the revitalization of collective intelligence [7]. The issues to consider are:

- Generalize the use of ICT / ICT.
- Respond to the current needs of the various stakeholders of the University: Students, teachers, staff and new audiences of the university.
- Anticipate the new needs of university stakeholders.
- Improve public service.

D. Proposed technical approach

Taking into account the experiences of Moroccan universities using the UPortal tool. These universities have customized the default environment to suit their needs. For example: Ibn Tofail University in Kenitra, Abdelmalek Essaadi University in Tetouan and Hassan II University in Casablanca.

The approach proposed in this section is developed on the basis of my knowledge in the field, my parallel training, my internships and my experiences. It does not require additional investments, but rather an appropriate organization, which aims at a portal operating autonomously and then gradually connecting it to the various components of the information system: LDAP directory, CAS authentication server and Apache server.

Before detailing our functional approach, below is a diagram giving an overview of the technical approach presented at the Marrakech meeting of the AGENT project (support for the improvement of university governance by setting up an digital workspace), organized from 05 to 07 December 2013.

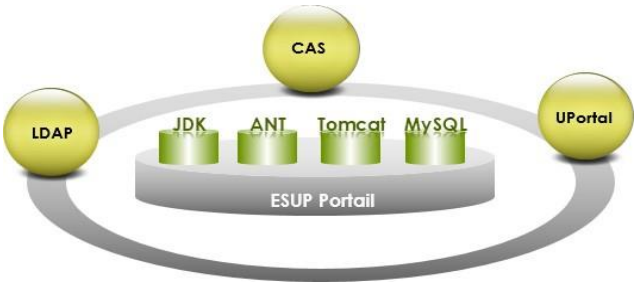

Fig. 1 The ESUP-Portal solution

The main features of Esup-Portal are:

- Support for different Database Management System (DBMS), uPortal can be linked with different databases: Mysql database, oracle, SQL Server, postgre SQL… etc.
- Direct access to the DBMS (JDBC) or by pool (Tomcat).
- Support for different authentication mechanisms, it can use different directories such as Active Directory, open LDAP or other.
- uPortal user accounts and self-creation of accounts.
- uPortal user attributes and mapping to other sources.
- uPortal groups and permissions, specify for each use the utilities needed for the installed applications.
- Channels and Portlets, to categorize and organize portal content.

E. Functional approach

Taking into account the above, the design and support of the organizational changes targeted by the establishment of an digital workpace, involves:

- Identify and act on the key success factors: information system, communication, intranet, resources, skills, ..
- Identify the actors, organizational proposal to be implemented:
  - Organization for the dissemination, installation, operation, maintenance and evolution of IT developments.
  - Organization for the supply and animation of content and services.
- Emergence of new "professions".
- Training actions.
- Administrative organization of the system.

Beforehand, we define the functional scope of the Digital Work Environments:

- Identify and study the services currently offered to the various stakeholders.
- Identify the needs for new services.
- Specify the services to be integrated directly and which will be accessible through the digital workspace.
- Define access modes and profiles: authentication,

user authorizations, location, type of terminal, availability…

The prerequisites to consider in setting up the digital workspace are:

- A project team and a project manager.
- Secure network architecture and administration (including the intranet).
- IT equipment and services for management.
    - The base of an ERP / ERP integrated management software package is installed
    - The LDAP staff directory is up to date.
    - The messaging system is open to all members of the establishment.
    - Connectors for third-party applications (eg: APOGEE, Moodle, shared calendars, storage, etc.) are available.
    - Authentication (CAS) is in use.
    - The web content management platform is in place (CMS).
- Administrative and educational governance is organized and roles and tasks are established
- Unified, secure access to the range of services and resources of its working community.
- The rights and modalities of contribution to the production of content are fixed
- Users are informed and trained in the proper use of the digital work environment.
- The resources are available as soon as the digital workspace is put into service.

So the functional architecture will be as follows:

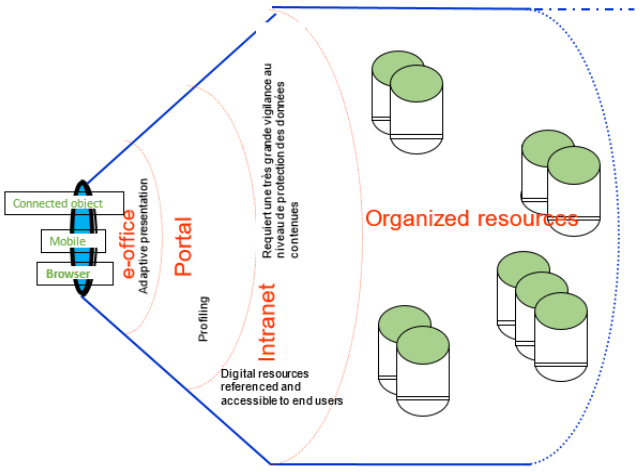

Fig. 2 Proposed functional approach for digital workspace

My proposal inspired by the experience of the University of Bordeaux Montaigne.

A successful Digital Space must be based on a Digital Master Plan clearly framing the strategic objectives and the means to be put in place to achieve them. For the development of a master plan respecting the strategic orientations of the university, we must formalize the work procedures, in order to better understand our activity [8], without forgetting the key performance indicators (KPI) as decision-support tools [9].

IV. FORMALIZATION OF PROCEDURES AND KEY PERFORMANCE INDICATORS

A. Formalization of procedures

The formalization of procedures will allow us to think about our own mode of operation and, more precisely, the improvement of processes to have better visibility and readability.

To formalize is also to schematize our daily actions using flowcharts, the main objective of which is to describe graphically and understandably by all the operating diagrams of the processes [10].

A single document covering the entire procedure: an introductory part, a flowchart (activity diagram), the procedure in detail (in editorial form) with the necessary documents.

Secondly, the writer (s) will ensure that a summary of the procedure is inserted, which can sometimes span several pages depending on its complexity.

We will find there in a summary frame:

- The objective (s) of the procedure (eg the administrative and financial set-up of a research project)
- The launch of the procedure.
- The closure of the procedure.

B. Key performance indicators: Case of the business process "Scientific Research"

Performance in an organization everything that, and only what, contributes to achieving strategic objectives, several notions can be linked to performance:

- Effectiveness: Carrying out an action
- Efficiency: Be concerned with obtaining the expected results at a lower cost
- Adequacy measure: Between the strategic objectives initially defined and the results actually achieved.

Performance - target achievement - is therefore closely linked to the notion of strategic management. In practice, this means making available to the management of the organization a limited number of various indicators grouped together in the form of a "dashboard", with the intention of helping its managers in their decision-making. strategic decisions.

The indicators are in the form of accounting and financial data, physical data characteristic of the activity (amount in MDH dedicated to research activities in a university for example), ratios (financial ratios, returns, etc.) or even qualitative information (synthetic opinions of students on the evolution of

research structures within a university, for example).

A comparative study was carried out in 2016 by the university, between the indicator guide for the research component developed within the university, the user guide for the RECET self-assessment benchmark (Strengthening of Competences in Institutional Assessment) [11] in the field of research And the questionnaire of the board of Accounts relating to university research and to which the university must respond. A study that I presented during the 5th edition of the Open Source Days, February 23 & 24, 2016, National School of Applied Sciences-Khouribga.

The question asked: Do the indicators currently defined ensure the coverage of all the university's evaluation criteria in the research component?

Concerning the correspondence of indicators defined in the university guide compared to the questionnaire of the Court of Auditors and RECET:

Evidence covered by indicators is 12%.

If we are interested in the indicators relating to the research component, they are divided into four sets:

- Research capacity indicators.
- Indicators of production of research activities.
- Capacity indicators for innovation and technology transfer.
- Production indicators in terms of innovation and technology transfer.

C. Discussion

In this section, I have presented the usefulness of formalizing procedures as a tool to help improve processes and understand the way of working. Among the good reasons for formalization:

- The time spent will be a benefit.
- Trust does not exclude follow-up.

The definition of key performance indicators will help to steer and measure the effectiveness and efficiency of an organization's processes.

IV. Conclusion

A successful digital transformation must not be done without the establishment of a specific analysis framework, and an appropriate organizational structure helping to optimal decision-making, that is to say an improvement of digital governance.

Improving digital governance requires the establishment of a Digital Workspace. A successful Digital Space must be based on a Digital Master Plan clearly framing the strategic objectives and the means to be put in place to achieve them. For the implementation of the Digital Master Plan, we must carry out a diagnosis of the current IS perimeter by answering the following 4 main questions:

- What are the strategic goals for digital?
- What are the preferred activities for the university with the most digital needs?
- What are the priority projects?
- What is the situation of the digital existence?

Afterwards, we will design and re-engineer the process mapping and target processes.

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