

An Empirical Study on the information systems in the Moroccan organizations: An explanatory model to decide differently and to optimize the IT governance

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Abstract— An information system, it's the key point of the success of companies [5] [6]. Where from the necessity of investing to develop information systems, these investments concern to infrastructures, application software's, set up systems, and existing processes.

Companies have to follow policies to manage well their investment of information systems in an economic and optimal way, it is the subject of this paper. To validate our subject, our hypothesis, a study of ground was necessary. We opted for an empirical study on the information systems of the high-level Moroccan organizations in various sectors, by basing itself on scientific foundations. The study and the data analysis allowed us to propose new simplified models.

Keywords— Direction of information system, investment of information systems, Information system, IT Governance, Empirical study of Moroccan.

I. INTRODUCTION

An information system is conceived to help the company to reach its goals. This system has to evolve with the evolution of these objectives. For that purpose, it is necessary to adopt an approach which presents least risks and which minimizes the costs to end always in a complete and completely integrated system.

The economy of the investment of information systems is badly known: diverse reasons contribute to darken the knowledge of their costs, and the function of information system didn't make to my knowledge the object of a precise formalization. Some head executive managements believe they can master the cost of the computing by following policies of IT management, but these policies, if we apply them blindly, can have pernicious effects. [2] If the costs are badly known, the contributions of the information system are it more still. No company can take place of an information system today; it is basic; but the decisions concerning it are rarely rational because we don't know how to estimate what it brings.

During its life cycle, any organization arrives at a phase during which it expresses a lack of resources which allows him to mitigate its strategic needs. The latter can concern the financing of its cycle of investment of information systems, in the objective or to develop its activity or to spread its economic perimeter towards other business sectors. [3]

II. DESIGN AND SURVEY METHODOLOGY

The expression of the strategic needs of the stakeholders of an organization can concern the management of its information systems in case it aims at deciding differently, and at evolving. It can also concern the financing of its cycle of investment in the objective either to develop and to spread the perimeter of its activity towards other business sectors, or to govern well its information system by perpetuating its activity. [7]

At this stage, the company is candidate, influenced by various marigolds, operates by a refereeing allowing him to choose between a diversity of reference of the IT governance and to invest with optimal and reasonable costs in information system.

Most of the scientific studies on the subject of the governance of information systems showed that the implementation of a good practice of the IT governance can succeed on conflicts of selection between the various best practice for the company be candidate and conflicts of the economy of the investment in information system. The decision of the latter " the selection of an IT reference and the economy of the investment in information system " being influenced by internal or external constraints.

To understand better the factors which impact on the economy of the investment of information systems and selection of an IT reference as well as actions susceptible to act positively on companies to evolve his activities, we led a quantitative study by means of a questionnaire with analysis and interpretation of the results.

2.1 Survey Methodology

In this article we present the philosophy adopted to properly conduct our investigation, objectives, exposing the methodology and analyze the results.[10][11][12]

2.1.1 Description of the survey

In the phase of harvest of the data of this work, we opted for a survey by questionnaire [1][4], the general aspects of which are presented below.

2.1.2 Problem

What are the factors which influence the decision of companies to opt for deciding differently, for evolving and for saving the investment in information system in Morocco?

2.1.3 Objective of the survey

- Understand the features which characterize the behavior of companies in their choices of an IT reference.
- Raise some measures susceptible to save the investment in information system.[8]

2.1.4 Target of the survey

We based ourselves on the list of 51 big Moroccan companies which have potentially all the assets to improve their information system and to save the investment in information system in Morocco. A representative sample is going to allow us to normalize the answers so that they are very close to the reality of all the companies of the population mother.

2.1.5 Support of the survey

To lead well our study, we based ourselves on questionnaire which we developed according to the following approach:

Our questionnaire incorporates the following elements

- The types of communication between the internal actors and the external actors of companies; [11][13]
- The financing adopted in the DSI more exactly information systems;
- The utility of information systems; [4][9]
- The management of information systems; [13]
- The incentive measures in the selection of an IT reference.

2.1.6 Plan of sounding

Within the framework of this present article we opted for a methodological approach in the determination of a representative sample of the companies which present a high potential to decide differently, to evolve [9] and to save up of the investment in information system.

The choice of the sample is based on a careful selection of individuals to treat all the business sectors.

We are going to demonstrate the distribution of the population studied according to all the activities declared by the HCP (the official classification of the naming).

Secteur d'activité Entreprise

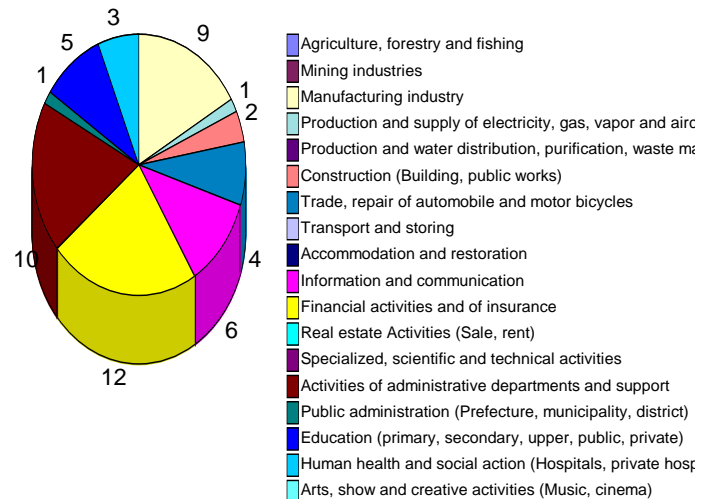


Fig.1: business sector of the studied population

2.2 Perusal and analysis of the results

This part will be reserved for the analysis of the answers receipt with companies and it is true from the statistical treatment of the data obtained to have an understanding of the factors which impact on companies to decide differently, to evolve and to save the information systems of the Moroccan organizations. And in the light of these results, we are going to try to bring our recommendations.

2.2.1 The studied variables

Business sector, Budget DSI, Management IT, Cost of IT, Size, Cost, Utility IT. This study produces crossed paintings, graphs with clouds by basing itself on the factorial analysis by correspondences.

✓ The body Investigated.

Table 1 : The body Investigated

responding Company	Nb. cit.	Fréq.
President - General manager	4	7,8%
General manager	5	9,8%
Commercial director	2	3,9%
Human Resources Director	4	7,8%
IT Director	4	7,8%
IT Director or Director of the Information System	1	2,0%
Finance Director, Administration, Audit, Management Contr	12	23,5%
Advisor to the Cabinet	2	3,9%
Assistant (e)	2	3,9%
Other : ...	15	29,4%
TOTAL OBS.	51	100%

The majority of the people who answered our questions have a good profile what would give more sense and relevance to the counted answers.

✓ IT Utility and IT Existence

Companies, studied population, benefit from the implementation of information systems.

Table 2: the evaluation of "IT Utility IT" compared with the "IT existence"

IT Existence	Yes	No (Go to Q45-Validation)	Ongoing (Go to Q45-Validation)	I don't understand the question (Go to Q45-Validation)	TOTAL
IT Utility					
Non réponse	0,0	100	0,0	0,0	100
Reduce the costs of our investments	100	0,0	0,0	0,0	100
Perform daily tasks	100	0,0	0,0	0,0	100
Manage our business	100	0,0	0,0	0,0	100
Minimize risks	100	0,0	0,0	0,0	100
Control our management rules	100	0,0	0,0	0,0	100
Optimize our choices	100	0,0	0,0	0,0	100
Benefit from the experience of other organizations	100	0,0	0,0	0,0	100
Benefit from the experience of other services	100	0,0	0,0	0,0	100
Saving training costs	100	0,0	0,0	0,0	100
Saving certification fees	0,0	0,0	0,0	0,0	0,0
Something else	100	0,0	0,0	0,0	100
I don't know	0,0	0,0	0,0	0,0	0,0
TOTAL	82,4	17,6	0,0	0,0	100

The persons in charge have to think always of improving their information systems, to benefit more from their utility.

✓ DSI Budget and Effective

The figure below explains well the change of the DSI budget according to effective of company. We notice that the DSI budget is unpredictable compared with the size of the studied companies.

Table 3: the evaluation of "Budget DSI" compared with the "effective of company"

Effective	Less than 100 employees	100-500	501-1000	+ 1000 employees	TOTAL
DSI budget					
No response	41,7	16,7	16,7	25,0	100
Less than 100,000 MAD	26,7	73,3	0,0	0,0	100
from 100,000 to 500,000 MAD	75,0	25,0	0,0	0,0	100
500,001 to 1,000,000 MAD	42,9	0,0	0,0	57,1	100
+ 1.000.000 MAD	30,8	30,8	0,0	38,5	100
TOTAL	37,3	35,3	3,9	23,5	100

- To have more profitability of information system, it is necessary to increase a reasonable budget compared with the size of the company and its activity.
- It is necessary to give more importance for the DSI. (The DSI is not any more a service support)

✓ DSI Budget and IT Management

In the studied sample, we notice that there is not a relation bijective between the DSI budget and the IT management.

Table 4: the evaluation of the budget DSI with regard to the management IT

IT Management	Non réponse	Yes, totally	Oui, partiellement	It hasn't	I don't know	TOTAL
DSI budget						
No response	75,0	0,0	25,0	0,0	0,0	100
Less than 100,000 MAD	0,0	43,3	46,7	0,0	0,0	100
from 100,000 to 500,000 MAD	0,0	75,0	25,0	0,0	0,0	100
500,001 to 1,000,000 MAD	0,0	0,0	100	0,0	0,0	100
+ 1.000.000 MAD	0,0	61,5	38,5	0,0	0,0	100
TOTAL	17,6	37,3	45,1	0,0	0,0	100

✓ DSI Budget and choice of IT reference

The table 5 shows that the choice of the IT reference is made according to the certification of the employees, the organized trainings IT, the costs of deployment, and sometimes can be imposed or according to the DSI budget.

Table 5: the evaluation of the "DSI budget" with regard to the "choice of IT reference"

DSI budget	Less than 100,000 MAD	from 100,000 to 500,000 MAD	500,001 to 1,000,000 MAD	+ 1.000.000 MAD	TOTAL
choice of IT reference					
Depending on the certifications of employees	0,0	0,0	0,0	100	100
Depending on the IT training organized	0,0	0,0	0,0	100	100
Depending on the costs required to deploy IT reference	38,5	0,0	23,1	38,5	100
A random choice	100	0,0	0,0	0,0	100
A choice imposed by the general manager	0,0	0,0	0,0	100	100
A choice imposed by stakeholders	22,2	33,3	0,0	44,4	100
I don't know	16,7	16,7	66,7	0,0	100
TOTAL	29,4	7,8	13,7	25,5	100

The choice of the IT reference isn't correct which can engender a bad choice.

✓ DSI Budget, IT Management and Cost of information system

The cartography below analyzes three factors DSI budget, IT management and cost of information system by presenting the perception and the interaction between them.

We notice that the companies which invest a budget more than 1 000 000 Dhs, rest with a cost averagely high and an IT management which cover partially all of IT needs (Zone C).

For other zones, we see good that there is no equivalence between three factors which influences the good IT governance.

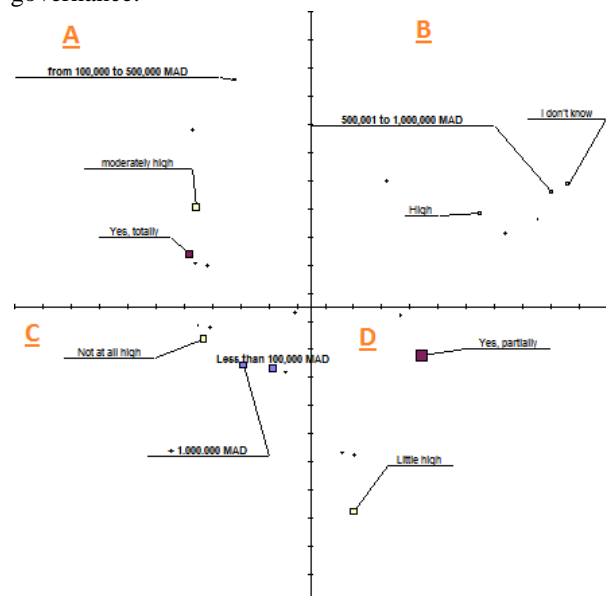


Fig.2: analysis of the multiple correspondences " Variable: DSI Budget, IT Management, Cost of information system "

The persons in charge have to react to improve the efficiency of the investments and manage (govern) them information system in a successful way to reduce the costs of information system.

✓ **Cost of information system, IT Management and IT effective**

The cartography below analyzes three factors: IT effective, IT management and cost of information system by presenting the perception and the interaction between them.

We notice that the companies which have a size of information system staff more than 20 employees, introduce a good IT management and a cost so high exploits. We see that there is a mathematical function between three factors.

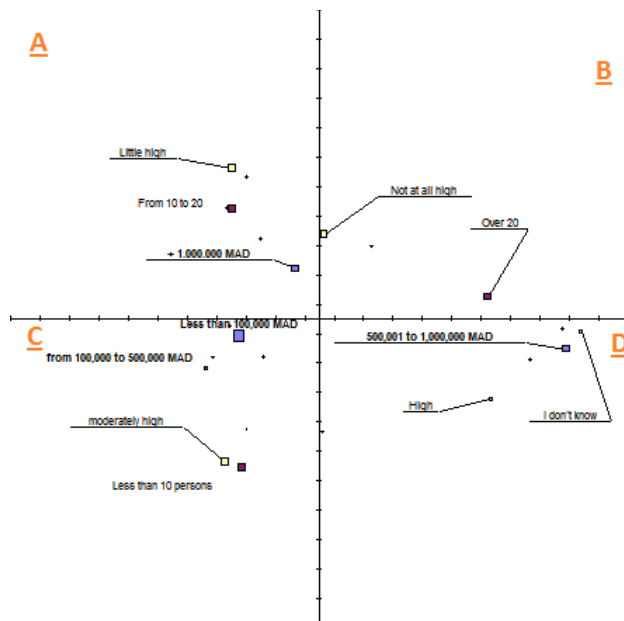


Fig. 3: analysis of the multiple correspondences
“Variable: cost of information system, IT Management and IT effective”

There is a linear function between the good IT management, and the combination {IT effective, Cost of information system}.

III. HYPOTHESES AND RECOMMENDATIONS

3.1 Hypotheses

According to the problems raised by the questioned companies, we can extract the following hypotheses:

Hypothesis 1: the good governance of information systems

The construction of a strategic vision of an organization is considered as a major requirement of the Direction of Information Systems (DSI), and this seen its contribution

to the global performance of the organization. The smooth running of the information system of an organization, their evolution and their effective improvement of the quality of services of information technology, is reasoned by the multiplicity and the diversity of the reference of best practice and of the different methods to assure a good governance of information systems.

Hypothesis 2: the economy of the investment of information systems.

To produce always better, always cheaper is a leitmotiv common to all the companies, about is the examined activity sector. Companies working in the field of information systems are not thus spared by expiring facts. The improvement of the quality level of their services and their products, the control of their processes and thus associated costs can be made by using dozens reference of the best practice.

Hypothesis 3: the selection of the best IT reference

The variety of reference tables puts the information systems managers in front of a problem of joint of these reference to realize a good management, especially as there are reference which aim to be global and which handle all the fields of activity of the IT without being detailed enough, and those who handle a domain in particular in detail without a global view.

This diversity of these frames so raises a strategic difficulty for companies to choose the adequate frames of the IT governance.

3.2 Recommendation

The IT governance is an emergent subject in the world of the information technology. However, and this day, there is a lack of research works on the approach of selection of IT frames compared with strategic objectives.

We suggest describing a correspondence between the objectives strategic of an organization and the processes of IT frames by basing itself on a decision-making system to select the best IT reference by report a strategic objective. Furthermore, given the importance of the interaction, the coordination and the collaboration in information systems, we propose a solution which answers these essential requirements for the appropriate functioning of an organization.

IV. CONCLUSION

Through this article we have in other ambitions no that to highlight the factors which impact on the good progress of the activities of the Moroccan companies.

This empirical study on information systems, shows that there is a lack on a selective approach to choose an IT

reference as well as a problem of the exploitation of the budget in an effective and optimal way.

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