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The Impact of E-Management on Organizational Performance: An Empirical Study in Tunisian Firms

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***Abstract*—** E-management is a new approach that emerges as the rapid development of Internet and e-enterprise environment. This approach is an effective method for the company to win competitive advantages or core competence. E-Management decisions are likely to have an important and unique influence on Organizational Performance since it introduces the researcher to new theoretical approaches. Our hope is to explain the link between E-Management and Organizational Performance. E-management, which is very simplified by the IT introduction, is seen in the organization as a means for the best management. The method of structural equation was adopted to conduct our exploratory and confirmatory analysis. We study the organization's level through a multi-case study, to look for regularities, divergences and convergences between the elements of the different studied cases. The results arising from the questionnaire sent to 155 E-managers affirm that the adoption of E-management approach influence the performance of Tunisian firms. The principal aim is to identify unresolved questions in need of future study and building a more cumulative body of knowledge that will have key implications for both theory and practice.

Keywords— E-Management, mode of management, Management, ICT deployment, Organizational Performance

I. INTRODUCTION

IT management is the process of overseeing all matters related to information technology operations. The Internet is one of the most important discoveries that allows fast communication between organizations and make the world as a small village. The IT management is the most important applications of information technology. IT management refers to the monitoring and administration of an organization's information technology systems. IT management focuses on how to make information systems operate efficiently [1].

Therefore, this project should support the E-management although there are many obstacles that find the application of e- management, but this could justify staying on the traditional management.
Also, E-management is an approach that has attracted scientists. The new approach helps the company to ensure the optimal use of Information and Communications Technology (ICT) [2], [3].

Many papers have been written about the value of this concept and the strong relations "E-management – performance". The principal interest of these works is to represent this new approach of E-management [4], [5].
In the light of the above literature, this paper attempts to determine of E-management on perceived Organization Performance.

II. RESEARCH OBJECTIVES

The core aim of this theoretical paper includes three objectives:
Objective 1: To learn about the basics of E-Management, its nature, and components in the basic sense.
Objective 2: To know about E-Management including the reason and protecting tools and measurement.
Objective 3: To investigate the impact of E-management practices on Perceived Organizational Performance.

III. REVIEW OF RELATED LITERATURE

In 2000, [3] defined the concept of e- management as follows: "E-management can be defined by integrating all the management processes, that is, Finalization, Organization, Animation, Control. It might have a positive impact on the opportunities provided by the new Information and communication technologies (ICT)".

The Tunisian observatory in E-management: (the development and enrichment of the theory of e-management)
In 2005, the global consortium in E-management [2] has developed the framework of a study carried out by the Tunisian Observatory in E-management; a study in e-management about Tunisian companies. Indeed, this study was carried out on a sample of 407 Tunisian companies. It showed that the use of new technologies by the company has been developed in a very significant and varied way [6].

Indeed, he noted that this theory has made it possible to discover the very rapid development of the culture of the net with the heads of companies and even the staff of the company [7].

The main result of the Tunisian E-management observatory is that E-management, in reality, is a continuity or development of traditional management [8].
Apart from these findings and representative works of e-managerial practice, we can mention other researches, most of which are simple definitions of the concept of e-management [9].

Reference [10] defined E-management as a management mode integrating information and collaboration technologies. Also, [11] has proposed the following definition of e- management:
"The term E-management (electronic management) is an English term. In French, the correct term is "la gestion électronique".

It is the management mode associated with the integration of new information and communication technologies (including the Internet) with all the administrative processes of a company or an organization, in order to improve the Productivity and efficiency ".

Reference [4] represents the management as a set of activities of organization, management of the company, and its personnel, through computer tools.

Given this observation, the main objective of this study is to develop A scale of measurement of E-managerial practice which is a new management mode based on the integration of ICTs for use in any type of e- organization. It will be a question of proposing the first elements of validation, in particular by testing its internal validity, the stability of its factorial structure.

The Two Main Dimensions of E-Managerial Practice (Managerial and Technological Dimension)
This study asserts that the concept of E-management has two dimensions:

The managerial Dimension
Reference [12] shows that E-management contributes to the improvement of management functions thanks to the use of ICT. Based on this finding, the present research determines the key factors that can help the company considering making an investment in IT to improve their management mode [6].
Also, [13] proposed a measurement of the construct "mode of management", through formalization, risk taking, creativity, performance and oriented management.

The Technological Dimension
[14], were among the first to define the concept of technological deployment, combining information systems and ICT strategy. According to the authors, companies would have a different technological deployment according to their main strategic activities: prospecting, analysis, defense and reaction (typology proposed by [15]).

Adapted from the work of [15], [16], a model of technological deployment in six dimensions has been presented: The technological architecture, the strategic impact of the information systems department, technological intelligence, the source of information systems development, the evaluation of information systems and the teams management style.

With the continuous introduction of new information and communication technologies within the company, a complete reconfiguration of the company's managerial process is taking place.

In fact, according to, [17] management is confronted with multiple demands such as the need for new human resources strategies or the emergence of new forms of work (e-collaboration, e-working, E-learning, management 2.0, 3D management ...).

In this vision, [5] argues that E-management is considered to be the right mix that allows for the harmonization between the management mode exercised by the company and the technological resources that help to provide support for their deployment.

This new E-management measurement tool would allow us to know how e-managers practice e-managerial theory within their companies.

To develop this scale and to provide elements of validation, three successive stages are proposed. Firstly, a pre-survey phase will allow to isolate the evaluation indices on which E-management is based, which is a new management mode based on the integration of ICT. The analysis of these data leading to the construction of the items on the scale. In a second study, the scale developed will be administered to a second sample.

The objective of this step is to explore the factorial structure of the scale. Finally, a third study will verify the stability of the structure previously identified. Data will, then, be collected from a new sample and confirmatory analyzes will be conducted for these purposes.

Definitions of the E-Management Concept
Researchers in Information Systems (IS) are increasingly interested in the notion of E-management. The ambiguity of this notion comes from various definitions proposed to define it.

E-management is a continuous dynamic process that ensures harmony between all the components of the Management / ICT relationship in order to improve the performance of the company.
Indeed, E-management is generally regarded as an approach that naturally contributes to the evolution of enterprises [2], [5], [18], [19].

The concept E-management finds its origins in the technological theory, which stipulates that the performance of the company is the result of the deployment of ICT [20]. Indeed, [21] defines it as the set of seven processes fed by an information system based on electronic information processing technologies. It is characterized by processes modified by electronic technologies and, therefore, by modified skills.

Reference [10] expose that E-management is the result of a harmonization of management mode with the use of ICT. Thus, the performance of the company is the result of the congruence of these components. In this vision, e-management is considered the right mixture allowing the harmonization between the management mode exercised by the company and the technological resources that help to provide support for their deployment.

Indeed, the impact of E-management on performance is a concern that has evoked and still evokes the interest of several research observatories for several years [the Tunisian observatory in E-management and the French observatory Of Dauphine-Cegos, etc ...].

Reference [11], proposed a definition similar to that of [10]. He affirms that E-management is a "management mode associated with the integration of new information and communication technologies (Including the Internet) to all the administrative processes of a company or organization, in order to improve their productivity and efficiency ".

Reference [4] said "E-management is the whole of the activities of organization, management of the company and its personnel, through computer tools".
In a more detailed definition, [6] defines e- management as "being both a new philosophy, new principles and methods of management but also new profiles and behaviors of managers».

IV. CONCEPTUAL FRAMEWORK

Results Traditional management methods should therefore be reviewed. There is a need to anticipate the changes to be implemented in management modes daily. Two actions should be considered: invent new evaluation systems (collaborative maturity, use of technologies, etc.) and collaborate (collaborative management, assistance in the use of technologies, empowerment and accountability). Indeed, the perception of managerial quality, which relates specifically to relations and the role of managers, as well as the perception of management methods and managerial practices.

Reference [10] Announces that it is necessary to have an efficient "management mode" adaptable to the requirements of the modern enterprise. "Becoming a smart business is specific to the knowledge economy that is particularly prevalent today. Indeed, the type of economy has an impact on the activities and on the "modes of management".

Indeed, [12] shows that E-management contributes to the improvement of management functions, thanks to the use of ICT. Based on this finding, the present research identifies the key factors that can help the company considering making an investment in IT to improve their management.
We, therefore, advance our first hypothesis:
An oriented management mode towards E-management has a positive impact on the performance of the company.

E-Management Promotes the Deployment of ICT
For many years, management science, economics and industrial sociology have taken up this issue by putting forward proposals to try to understand the possible links between the deployment of ICT and performance [21] [22] Thus, researchers increasingly use the relationship between information technology and business performance as complex and multi-dimensional.
Reference [15] is the first to define the concept of technological deployment, which combines information systems and ICT strategy.

According to the authors, companies had a different technological deployment according to their main strategic activities: Prospecting, analysis, defense and reaction [14]. Adapted from the work of [15], [16], a model of technological deployment has been presented in six dimensions: The technological architecture, the strategic impact of the information systems department, technological intelligence, the source of information systems development, the evaluation of information systems, the management style of the teams.

The analysis of the publications, relating to the "ICT - performance" relationship carried out by [16], shows that the vast majority of previous work has succeeded in highlighting the positive impact of ICT on company performance [23], [24].
Thus, our second research hypothesis is as follows:

The deployment of ICT has a positive impact on the performance of the company.
New technologies are shaking up both work practices and the software market. Technologies related to E-management are participative and customizable with dynamic content generated by the users themselves. While old technologies are too complex and rigid, E-management technologies are flexible and easy to use and install.

Indeed, the five findings identified regarding the introduction of NICTs in companies: The first observation concerns, first, the fact that information technologies will continue to evolve and Effect of shortening time and distance.
Next, in terms of individuals and roles, for example, the staff will benefit from new work tools, and increased connectivity to exchange information.

As the working method evolves, there is an appearance of new organizational structures. In the case of the Management Process, the change induced by the NICTs

will cause a redistribution of power and control. Finally, in terms of Strategy, NICTs can change the nature and degree of the interdependencies that exist within a branch of the economy and more particularly an enterprise.

E-Management is a New Management Mode that Favors the Deployment of ICT

According to [10];"E-management is a management mode integrating information technologies". This new method of management is a real lever for perennial performance shared by all players in modern organizations who are required to renew their management methods in order to implement a performance improvement approach.

We are at the beginning of a new way of management. Knowing how to manage at a distance means knowing how to take advantage of the opportunities offered by ICT while at the same time controlling the risks and abuses that arise from it. Indeed, the mission of the e-manager is both to maintain the links and collaboration within the team and to verify if the work is carried out.

According to [16], as the managerial function is increasingly confronted with the problems of integrating new technologies into the company's environment, it becomes essential to approach new management methods.
With the constant introduction of new information and communication technologies within the company, we are witnessing a complete reconfiguration of the company's management process [25] [26].

Indeed, according to [17], management is confronted with multiple demands such as the need for new strategies of human resources or the emergence of new forms of work (e-collaboration, e-working, E-learning, management 2.0, 3D management).
We, therefore, advance our third hypothesis:
E-management has a positive impact on the company's performance.
The figure below shows the E-management model: (Fig. 1).

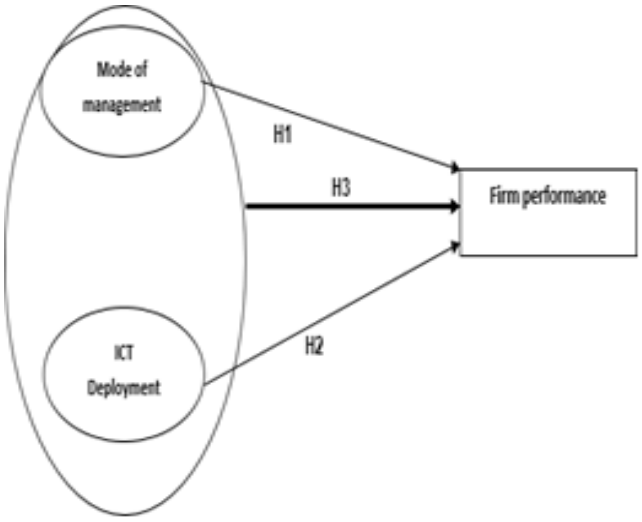

Figure 1. E-management model

V. RESULTS AND DISCUSSION

In this section, we will try to present the following methodology: data collection, the choice of the model, as well as the analysis of the main results found using statistical method.

To study the impact of E-management on the performance of Tunisian firms, we opted for companies of different sizes and operating in different sectors of activity (services sector, tourism sector, industrial sector).
We were able to collect 155 responses for 310 questionnaires sent. The result is a response rate of 50%.

Measures of Variables

The specification of the constructs of the research "management mode", "deployment of ICT", "e-management" and "company performance" is carried out based on the literature review in information system dealing with Relationship between E-management and performance.

The variables selected in our model are measured by items from previous research, in particular those from [13], [15] adapted to our problematic, or by items created for the purposes of our research.

Given these elements, we have opted for a subjective measurement scale of organizational performance. These items are collected on Likert scales in 5 points (ranging from "disagree" to "strongly agree").

Analysis Model

In order to verify the validity of the measurement scales used, we first performed a factor analysis of the ACP type ("Principal Component Analysis"). Secondly, we performed a confirmatory structural analysis with the AMOS software (24.0) in order to test our research hypotheses.

Factorial analysis allows us to structure the items we seek to measure and to extract the factors that best explain our research variables.

For our first construct "mode of management", we got three factors. The first is "formalization" (FORMA_), the second is "risk taking" (PRISE_), and the last factor corresponds to "creativity" (CREA_).

The following three factors, allow us to measure our second "ICT deployment". They correspond to "ICT architecture" (ARCH_), technology watch (VEILLE _) and Source of IS development (SOURCE_).

The last two factors allow us to measure the "performance of the company" in terms of growth (PERF_CROIS) and profitability (PERF_RENT).

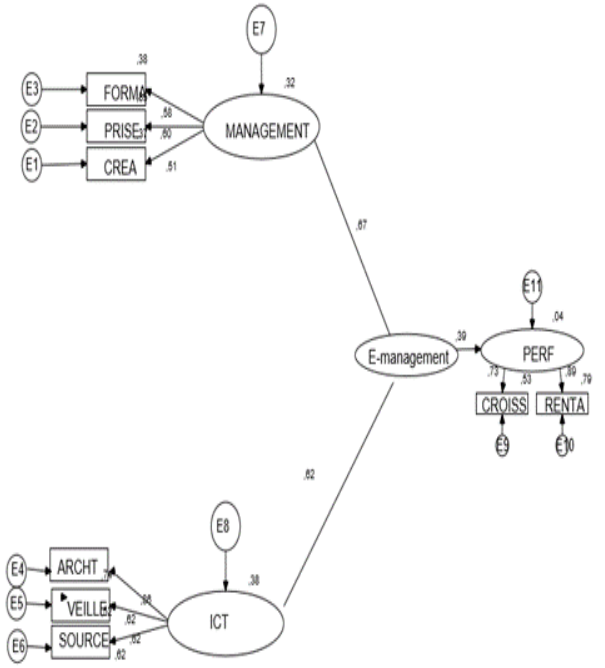

Figure 2. The structural Global model

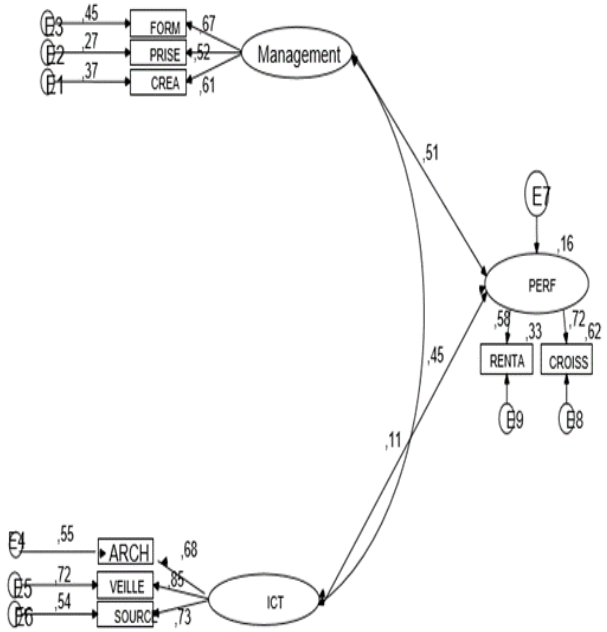

Figure 3. The structural direct model

After testing the model using the structural equations, it appears that the conditions tested model Fit to the data are generally respected: The value of khi 2 / dl is less than five, it is equal to 2.054.

The GFI and AGFI coefficients are above the standard of the exploratory investigations mentioned (> 0.9).

Estimated Model

Our research model is tested by the structural equation's method. The AMOS 24.0 software is used to carry out the confirmatory factor analyses of the constructs "mode of management", "deployment of ICT" and "performance of the company".

These constructs are considered as unobserved or latent variables measured by observed variables (the items listed in the Appendix) considered as reflective indicators. (Fig. 2).

GFI = 0.942 and the AGFI = 0.909, translate a good "fit" between the model and the data. The RMR index is equal to 0.076 and the RMSEA is equal to 0.089. On the side of the indices used to judge the fitting quality of the model such as the NFI and the CFI, they have respectively the following values of 0.902 and 0.924.

We can, therefore, conclude that the adjustment of the proposed model is acceptable according to the results of the evaluation indices used. Therefore, we can retain the estimates of the regression coefficients and the explained variance percentages R2 for the variables, which will allow us to assert or invalidate our main research hypothesis.

The regression coefficient between E-management and the company's performance is significant (student t test of | 2,112 |). This result allows us to confirm H 1 stipulating, "E-management positively influences the performance of the company".

In order to verify the other hypotheses of our model, we proceed to the test of the direct model allowed taking into account the relations between the explanatory factors (Fig. 3).

After having tested the model using structural equations, it appears that the conditions of fit of the tested model to the data are generally respected.

An examination of the various indices shows that the model is acceptable and adjusts adequately to the empirical data for reliable parameter estimates. The value of khi 2 / dl is less than 5, it is equal to 2.054.

The coefficients GFI and AGFI have respectively the values of 0.932 and 0.901. The RMR index is equal to 0.065 and the RMSEA is equal to 0.096 for the NFI and the CFI, they have respectively the following values of 0.912 and 0.941.
The estimates of the regression coefficients and the explained variance percentages R2 allow us to verify the other hypotheses explaining the different links that may exist between the components of the alignment and the performance of the company.

The regression coefficient between the mode of management and the performance of the company is significant (test t of student = | 2,232 |). This result allows us to confirm our second hypothesis.

Similarly, the regression coefficient between the deployment of ICT and the performance of the company is significant (the T test of student t = | 2,076|). Therefore, our third hypothesis is confirmed.

VI. CONCLUSION AND FUTURE SCOPE

This research is an extension of a series of studies. Our paper presents E-managerial practice as a determinant of performance in Tunisian firms.
The results of the research led us to propose an original explanatory model of E-managerial practice, which can constitute a theoretical basis for the development of modern enterprise.

In conjunction with the review of the literature, we conducted a quantitative study by means of a questionnaire for E-managers in active Tunisian companies. Indeed, the analysis of the results enabled us to verify, "A good E-managerial practice makes it possible to improve obviously the performance of the company".

As for the contributions of our work, the first contribution is theoretical and lies in the simplification of a very complex approach to practicing which is the E-management approach. This approach is complex, but understandable, which makes it possible to highlight the implications of ICT in multidimensional perspectives.

The second contribution of our work is of a practical nature, the results obtained have shown that the deployment of ICT within the company requires huge investments (videophone systems, e-mail, Intranet, etc.); which is obviously indispensable in all modern enterprises.

There are a number of limitations to our research, such as the small number of respondents who cannot draw general conclusions. It would, therefore, be desirable to resume our study and choose a larger number of E-managers to be interviewed.

This research study opens up several research perspectives. First, we could conduct a quantitative study on a broader representative sample of several Tunisian firms to empirically test our results. Indeed, in order to accomplish the results of our study, it would be interesting to make a comparative study between Tunisian companies and foreign companies.

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