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PROBLEMS AND RESTRICTIONS IN THE MANAGEMENT OF DIGITIZATION PROJECTS IN LARGE COMPANIES

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Abstract

The paper has the following chapters: the need for a good result from the cost-benefit analysis, multi-disciplinary elements in the management of digitization projects, knowledge management in digitization projects, ethical issues – restrictions in digitization projects, natural opposition to change of organization. The use of cost-benefit analysis has the following moments of use: before its launch or choosing the option to carry out the project, if the need for a project for which there are several implementation options has been established by other methods. In digitization projects, one of the concepts used more and more is that of smart infrastructure. Recent management talks about the fact that systems are much more important now than before. One of the problems with current systems is connection.

In the case of digitization projects, there are also components that aim only at acquiring the skills necessary for new technological systems or work procedures. In their case, there are many elements already established in the field of education. One of these is the relationship between the importance given to certain knowledge and its usefulness.

Annals of Spiru Haret University.
Economic Series
Since 2000
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Issue 1/2022

The process of globalization has extended internationally the regulation of the ethics of certain professions, including in the field of ITC and project management in large companies. The professional ethics as restriction of digitization projects are applicable not only to multinational companies, but to all those operating in a global market.

Staff confidence in the usefulness of digitization projects must aim for maximum capacity. Digitization can be conceived as a solution to increase the revenue of the companies as a financial source to motivate the staff.

Keywords: *digitalisation; large companies; management; projects; restrictions; cost-benefit analyses.*

JEL Classification: M15

Introduction

In the field of cost-analysis is relevant The Methodology for Feasibility Studies (BIRD). For the use on concept innovation in the management of the projects a new contribution is the paper of Robbie Richards [Richard, 2021]. For understanding of education as a investments is the book of Mrs Marta-Christina Suciu [Suciu, 2000]. For the connection between management and ethics in a global approach are important the papers published by the Journal of Intercultural Management and Ethics [JIME, 2020]

One of the main directions of evolution in the knowledge society is digitization. The expansion of digitization is usually done on a project basis. This article aims to highlight some less studied problems and restrictions on the management of digitalization projects carried out by large companies. The importance of the theme results from the fact that not taking into account all the problems that appear in the development of a project can generate its failure.

1. The need for a good result from the cost-benefit analysis

The use of cost-benefit analysis has the following moments of use:

-before its launch

-choosing the option to carry out the project, if the need for a project for which there are several implementation options has been established by other methods.

In the case of using the cost-benefit analysis before launch, its application determines whether or not a particular project is economically appropriate. This

Annals of Spiru Haret University.
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variant compares the advantages and costs of maintaining a well-defined period of time of the existing situation with the advantages and costs of running the project.

The condition for this variant is to have only one option in carrying out the project.

If the need for a project but which can be achieved through several options has been established by other methods, the cost-benefit analysis can be used to choose the most appropriate option.

In reality, the more complex situation also arises, in which it must be established both whether the project is economically justified and the option chosen. In this variant, maintaining the existing situation is one of the options, along with those feasible for the project.

From the above, it follows that before applying the cost-benefit analysis it is necessary to establish feasible alternatives. Alternatives that do not meet qualitative requirements cannot be included in the calculation algorithm of the cost-benefit method. Such requirements may be those imposed by law, court rulings, contracts in force, pressure from the external environment that cannot be ignored. It is a temporary correlation between the components of a qualitative nature, which have priority at the moment, with those of a quantitative nature, which intervene at the end. Thus, from this point of view, in the launch of the projects, the purely qualitative and the purely quantitative aspects succeed each other, they do not intertwine.

In digitization projects, one of the concepts used more and more is that of smart infrastructure. The widely used comprehensive definition mainly indicates its composition and purpose: *smart infrastructure is the result of combining physical and digital infrastructure elements in order to provide valuable information to help make decisions faster and at lower cost* [Cambridge Centre, 2018]. From the specification of the elements that compose the smart infrastructure, we observe that we cannot neglect the physical systems. Regardless of the value weights of smart infrastructure, the operation of digital elements still depends on the parameters of the physical infrastructure. Romania, for example, has a sad experience in terms of the impact that the poor quality of some common elements of physical infrastructure, electrical outlets, can have. It thus becomes possible to separate the cost analysis for the physical and for the digital infrastructure, each having the right to refer to the technical efficiencies.

In addition to paying attention to the compatibility between the physical infrastructure elements and the digital infrastructure elements in smart systems, the digitization projects of large companies must also analyse the correlations between their standard operating times, the type of maintenance and component replacement

Annals of Spiru Haret University.
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Issue 1/2022

services, active lifetime up-grading mechanisms. All these aspects will be part of the cost-benefit analysis on the occasion of the launch of the digitization projects.

Another direction of digitization, including for large companies, is that of *Internet of Things* (IoT) systems. And here the structure is important. The main components of an IoT system are: data collection equipment, communication networks to connect the collection equipment, servers and other computing systems using the received data. This includes storage devices, analysis devices and dedicated applications [Vrabie & Dumitrașcu, 2018]. For digitization projects with IoT component, the cost-benefit analysis will include the acquisition value and maintenance services plus upgrading for each of these components, for the entire life of the respective systems.

The emphasis on cost-benefit analysis for smart infrastructure and IoT systems is exemplary and aims to use realistic data on investment in digitization projects. The accounting policies of large companies may allow, under certain conditions, certain components to be included in administrative costs, during the course of digitization projects. However, the business analysis must include a complete picture of all the elements related to investments in digitization projects.

Some managers of large companies, in order to preserve the existing state of affairs, introduce access to financing on the list of restrictions for digitization projects. The age we live in is rightly called globalization. In addition to material goods, services, labour and emissions, finances and money can easily cross borders. Companies, especially large ones, have access to any of the components of the global financial market. The cost-benefit analysis must include the form of financing as presented in the literature [Mihai, 2015], after which to act for the selection of the financier, including based on the cost-benefit analysis of the financing activity.

In digitization projects, you need to consider the types of process. It is still valid to classify processes into main (basic) processes, auxiliary processes and serving processes [Petrescu, 2019]. At the basic and auxiliary processes, there will be financial parameters for both benefits and costs. At the serving processes, cost parameters and parameters related to the volume of services or the quality of services performed or internal can be used.

2. Multi-disciplinary elements in the management of digitization projects

The parameters involved in the management of digitization projects differ depending on the positioning of companies towards innovation in general,

compared to digital innovation in particular. There are areas where digital innovation is a continuous flow. All companies in the field of information and communication technology are obliged to maintain an intense and constant pace of digital innovation. Any wrong step in this flow means losing your market position. Keep in mind that progress must be continuous, not in leaps and bounds. There is a great capacity on the market but also for users to capitalize on research results that have already become functional. Thus, the duration of capitalization of the more technologically advanced stage of the offer is limited.

Large multinational companies in fields other than information and communication technology have an organizational culture based on constant innovation. Lately most of the innovation processes are supported by digitization. The position of digitization is not always the same, even in the conditions of knowledge societies. There is a possibility that digitalisation is the benchmark, the main goal pursued by some form of innovation. However, the situation in which digitalization is a support element for social, economic, environmental etc. innovation, can be just as common. If digitization is considered as the central objective of an innovation stage, the relevant indicators of the digitization project will have the most important weights in any type of feasibility analysis.

Regardless of the type of project carried out, studies in the field of project management have shown that often the first cause of failure is insufficient or even poor communication. For this reason, one direction of digitalization is innovation in what are called collaboration tools [Toland, 2021]. All companies in various phases of development, redesign, modernization, repositioning on the market, restructuring, will feel the need for these projects to be supported by digital communication tools of the latest technology.

A classification used in the recent business language is that between local development and global development, respectively between linear growth and exponential growth. The design of a new stage in the digitization of large companies must start from its concrete data and from its real perspectives. There are large companies that do not pursue or can have in the object of activity only operations on the local market. Digitization is one of the six components of exponential development, sometimes identified under the phrase of the six Ds, along with concealment, dislocation, demonetization, dematerialization, democratization (Peter H. Diamandis, Steven Kotler, 2015) but only together with the others. By acting alone, digitization can only support the dynamics of a local company or one with linear growth goals.

Annals of Spiru Haret University.
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Issue 1/2022

Recent management talks about the fact that systems are much more important now than before [Peters, 2010]. One of the problems with current systems is connection. Thus, one of the problems of digitization is related to the connectivity of the systems to be upgraded. There is the alternative of digitizing existing processes, with small adjustments, or that of replacing them. It is said that sometimes before digitization, it is necessary to refurbish. Such an option is treated primarily on the basis of the time factor. Depending on the length of time we have available, we may or may not include the option of re-engineering before digitization. The problem is that upgrading delays digitization. If for the company the problem of connections and flows has already become pressing, the option of upgrading before digitization can no longer be considered.

The digital connection allows us to get to know better the people we do not have the opportunity to see face to face. Thus, through digitization there will be a new type of connectivity among people. This new type of connectivity will have to be treated appropriately from a technical, psychological, social, labour relations point of view.

Applied research in various fields of activity has drawn attention to vital points where the digitization effort needs to be focused. For example, in the field of trade logistics, one of the fastest growing activities in the context of globalization, must be logistics centres and transport hubs. These can be centres of responsibility or only cost places where the integrated computer processing of data on thousands of products and orders is required, under the conditions of remote processing and control [Gherasim & Mihalcioiu, 2019].

Theoretical developments based on the behaviour of companies support the emergence of a new generation of capitalism, in which cybernetics and digitalization have changed the previous basic parameters of business [Lazaroiu, 2019]. Changing the business model also means changing the behaviour of companies, especially large ones, thinking of new functional schemes in organizations, of new data and document flows. Last but not least, we can talk about new hierarchies within companies. The most difficult to change will be obvious in large companies. It is known that inertially, both in physics and in economics, depends on mass and speed. In the case of companies, we can accept that the degree of inertially depends on size (number of employees first, turnover, asset value), complexity (number of responsibility centres, number of business segments or lines of business) and the duration of stagnation or slow movement. Being human behaviour, habit becomes a rule and a real vector of inertially for stagnation.

Annals of Spiru Haret University.
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One issue that needs to be addressed by those implementing digitization projects is compliance with existing standards or those being developed. There is a broad trend towards universal solutions for many components of digitization. In addition, there are national or community normative documents of program type that guide the steps that need to be taken on different components of digitization [Mares& Mares, 2018]. Taking into account these standards or programs facilitates the connectivity of the organization with the rest of the business environment after the implementation of digitization projects.

3. Knowledge management in digitization projects

In the case of digitization projects, there are also components that aim only at acquiring the skills necessary for new technological systems or work procedures. In their case, there are many elements already established in the field of education. One of these is the relationship between the importance given to certain knowledge and its usefulness. In a simplified form, in the classical theory of education, we find *"the paradox of the relationship between ornament and content."* We also learn from the classical doctrine of education, that this problem can only be solved roughly. In addition, the recommendation of classicism in education according to which the path of natural knowledge is from concrete to abstract is usable even in the Internet age. [Spencer, 1973]. Thus, the acquisition of the skills necessary for the successive digitization stages will focus on the practical aspects, useful immediately in the company. It is recommended to use as trainers people who already know the functionality of the new digital systems and can answer concrete questions. The predominant part of the training will focus on concrete case studies, on solving problems with high probability of occurrence, not on atypical ones.

Recent developments have put into practice the results of research in the field of *artificial intelligence* that can help in the human effort to limit risks to decisions based on uncertainty. Such research also has an impact on what we call the conception, design, construction and maintenance of operating systems infrastructure [The Center for Intelligent Infrastructure Systems, 2021]. The design of new investments in which the use of artificial intelligence becomes operational implies, in addition to a degree of risk probably higher now, the need to exist during the operation of a well-developed research department. We cannot conceive of technological systems of the future in the knowledge society without being sure that we will keep pace with the innovation in the field of research-development-innovation.

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Issue 1/2022

The emergence of the ITC revolution opened up opportunities for technological progress. There have been cases in which the managers of large companies wanted to take more steps towards digitalization than was economically justified. Economic theory introduced the concept of technical-economic progress to emphasize that new systems must bring not only technical advantages, but also economic advantages [Freeman & Luc, 1994]. The cost-benefit analysis of digitization projects aims to be clear to the company the concrete economic advantages (increasing revenues or decreasing costs) that are brought by the technical advantages of the new systems.

In order to have good prospects for managing the new type of resources involved in digitization projects, the knowledge, managers of companies implementing such projects will take into account the growing demands of employees. It is recommended to pay special attention to the concrete application of the concepts of lucrative well-being at individual level, individual well-being of work, job satisfaction, as described in the analyses performed on advanced countries in terms of employee rights [Diotaiuti & Amodio, 2019]. Otherwise, the wealth embodied in the knowledge of the staff will be similar to a treasure of money without a safe and without a key.

As pragmatic as they may be, managers of large companies need to consider aspects of the economic theory of knowledge that have a direct impact on digitization projects. The new knowledge needed in the digitization process and those in the period of their exploitation raise problems of ordering, structuring, management. Formal access systems to them are required, as well as their permanent updating. There is an obvious gap between the behaviour of knowledge as new resources of the company in this type of economy compared to conventional ones [Ursacescu, 2009]. Managers will keep in mind that this particularly dynamic resource, knowledge, is difficult to control. Perishability, dissipation or loss of knowledge can easily lead to losses and the character of a non-rival good and a cumulative good can bring future benefits.

4. Ethical issues - restrictions in digitization projects

One of the main groups of restrictions that have become increasingly dynamic recently is the ethical ones. Social practice has seen a sharp rise in the ethical issues recently, with a clear trend toward the emergence of new specialized branches. Among these can be the R&D ethics, with a wide range of interference with intellectual creation ethics, professional ethics, bio-ethics. As an area of high public

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interest, academic ethics, including elements of research ethics (the one carried out in universities), has become so important that it is studied as a distinct discipline in universities. Among the older fields of ethics, political ethics and social ethics have an application in digitalization projects.

Digitization projects frequently appear as a result of extensive studies and research. The sequence of phases of fundamental research, applied research, technological development and prototype creation is no longer always observed. Sometimes, in digitalization projects, the technological development can have the decisive weight. But, even so, the research activity, understood in a broad sense, remains present.

For a long time, there were rules of ethics for each profession. The process of globalization has extended internationally the regulation of the ethics of certain professions. The internationalization of the business and size of companies has led to the concept of comprehensive professional ethics, applicable not only to multinational companies, but to all those operating in a global market.

Ever since the transition to the 21st century, interdisciplinary research has signalled the new demands of ethics. The extension of moral values in space and in the structural levels of nature "requires a capital re-examination of the fundamental principles of contemporary science, namely the transition from the anthropocentric paradigm to the biosphere-centric paradigm. And this will really radically influence the content of the basic principles of ethics" [Tirdea, 2000].

5. Natural opposition to change of organizations

Another group of restrictions on digitization projects is given by the *natural opposition to change in organizations*. Through digitization, major changes take place in terms of document flows, information, functional relationships between compartments, deadlines for legal or statutory tasks. There are a multitude of components that mark the individual behaviour of employees in the organization and their group attitude [Cole, 1995]. Among the factors that may cause the opposition to the introduction or expansion of the area of digitization in companies are: employee motivation, satisfaction with the work performed, the emergence of conflicts in organizations. By simplifying things to the maximum, we can establish ways that the 3 potential opposition factors to digitization do not make digitization projects more difficult.

In order to motivate employees, great attention must be paid to technical efficiency and labour productivity after the implementation of digitization projects. If

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Issue 1/2022

digital systems, through their technical catalogue yields, do not increase productivity, the company will not have financial sources to motivate the staff. We understand that digitization can be conceived not only as a change in the content of work, but also as a solution to increase the company's revenue. It follows that the projects to digitize activities that have a natural downward trend in demand are risky.

In general, the success of projects depends decisively on the human factor. In digitalization, the affective component of the human personality has an overwhelming role, difficult to compare with other fields. For this reason, staff confidence in the usefulness of digitization projects must aim for maximum capacity. Steps are needed to assess progress, including on a personal level. Only true leaders, with the capacity for real influence, will be able to achieve such performances. Managerial practice has formulated the principle of emphasizing the qualities of others as a basis for effective communication in the organization and for maximizing performance in motivating to goals [Cole, 2020]. The affective component can thus be one of the ways to combat the opposition of organizations to change.

Conclusion

The management of digitisation at large companies has problems and restrictions. First of all is the result of the cost-benefit analysis. In the same time the managers of large companies have to take in account the rulls of knowledge management in digitisation projects, including the classical theory of education. Ethical issues are more and more important restriction in many fields, including research for new technologies like ITC. Dididitalisation means an important change in the company. In large companies the change is more difficult to do. So the natural opposite to change of organization is very important for digitisation projects of large companies.

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