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Sustainability in the Information Society: A Proposal of Information Systems Requirements in View of the DPOBE Model for Organizational Sustainability

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Abstract

The importance of information in the world and the so-called information society places information systems in the center of the organizations´ sustainability. There aren't any owners of the economic information and there isn´t any real domain over the information systems, infrastructures and technologies and particularly over communications. These challenges display the relevance of all who assume the responsibility for management of information and technologies systems which can affect the normal functioning of the markets and economic organizations. Sustainability questions focus themselves on the articulation from several agents, on the management of information and technological resources and on the efficiency of markets, aiming to grant a peaceful and consolidated continuity of society. Beyond several factors which can be considered relevant to achieve organizational sustainability in the frame of information and knowledge society, there are some nuclear pillars in which managers and organizations need to develop competences. This theoretical approach, supported by a focus group research, aims to evaluate and propose a group of key elements to be measured for a proper evaluation of the organizations´ sustainability in the context of information society, taking in view future empirical studies and the application of the concept in management tasks.

Keywords: sustainability; information society; communication and information systems; information technologies; management.

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1. Introduction

The contemporary world has been growing not only in knowledge but also in complexity and speed. The prompt compliance of people to information and communication technologies has given rise to a wide interactive system where the demand among economic, technological and social forces generates disturbance in the economic environment.

This disturbance, following an increasing globalization and supported in the information and communication technologies, reflects itself in the possibility to access new markets, in the increasing of competition, in the loss of tangibility of products and services, in the easy access to the information, in the virtualization of organizations, in the increment of the economic speed, among other aspects, whose impacts have a tendency for an "universality" in the search for answers to the emergent necessities, placing new challenges to the organization´s sustainability. This could be understood as the capacity to keep a "healthful and long-term" activity.

In the present economic environment, everything is possible anytime and anywhere [1] [2]. In the scope of current knowledge and information society, the functioning paradigm is much more demanding, since the resources and the economic transactions are processed, by electronic way, at the speed of technology, not knowing borders or barriers. The decisions or actions that take place in remote spots of the world have consequences in distinct markets.

The economic and social dimensions are new. The virtual environment, the ubiquity, the urbanity, among others, infiltrate progressively, in a quiet and "apparently" harmless way, in the economical and organizational structures, assuming a character of permanency and vitality in their action and development.

The "current scene" is changing permanently. The permanent "omnipresence" of this feeling of change follows the demand of balance among economic, technological, social, political and cultural environments, as well as the constant attempt of adjustment, looking for survival in a world-wide economy more and more competitive [3].

New challenges of sustainability emerge in this current context [4]:

- Discontinuity versus Continuity
- Integration versus Differentiation
- Complexity versus Instability

The Discontinuity includes the perception that the speed of change is growing, that the result is more and more uncertain and unpredictable and that the change trends, currently, make a break with the past, instead of being a continuous and gradual development of it. The need of Continuity has to assume anticipated capacity to adapt and to develop new management templates and tools, which must fit the new demands of the market.

Other management concern is the necessity of Integration of activities and organizations, as a result of the increasing interconnection of the business world. The increasing competition, the arrival of new products, the technological differentiation, the crushing of commercial edges, among other factors, have originated a tendency to alienate a set of activities that don't belong to the core-business and, on the other hand, to search for partnerships. These partnerships create themselves needs related to interconnection and integration of activities, processes and information, among others.

Complexity is closely associated with the integration of businesses and also with the increasing discontinuity of the changes, inhabits in the difficulty in managing and controlling a set of factors, external and internal, that are essential to the good leading of their related activities. The scope of these difficulties has been growing as a result, among others, of the increasing speed of the markets, of the needed integration of activities between the economic agents and also of the product´s new life cycle, all these requiring, essentially, short-term decisions and both quick and secured actions. Moreover, synergies created by

technological innovation are associated with the possibility of performing in any market, with sale price cuts and also with the introduction of competitor or substituting products due to the technological innovation.

All these challenges are presented in the current complex structure of businesses, with an intensification of net participations in which we find difficulties that grow according to the requirements related to the integration of the activities in the different value chains, hopping to get a share of objectives, strategies, resources, information, systems and technologies and, over all, commitments.

It's in this economic environment of share and cooperation, that it is also marked by ubiquity, mobility, complexity and interactivity, that we must know how to frame the organizations sustainability [5]. This sustainability is achieved with the line-up of organizational frame along with the economic context, being aware that this alignment is necessarily plural and systemic and it also requires a shared attitude of cooperation, as well as a common platform to integrate and share the several existent systems [6].

2. Literature Review

There is no general consensus on the applicability of the concept of corporate sustainability [7].

The importance of this concept has been associated by several authors to an ecological vision, where the company is sustainable if it does not attack the environment, that is, if its use of natural resources for the development of its economic activity does not put in danger the rate of natural regeneration [8] [9] [10].

However, its application to businesses didn´t take other important principles into account, that firms have to satisfy (their customers /suppliers/ consumers) if they want to be truly sustainable, as well as eco-efficiency, socio-efficiency, eco-effectiveness, socio-effectiveness, sufficiency and ecological equity [11].

This set of principles induced other authors to consider corporate sustainability supported simultaneously in physical, social and economic levels, according to a modern and systemic conception of the environment and based on a culture of social responsibility and ethical principles in the businesses development [12] [13] [14].

This concept goes on with those who claimed that the central challenge for this century is to create a sustainable global economy and society supported by organizations that are not only sustainable themselves but also sustaining in their impact on society and on the biosphere.

It has never been more urgent than nowadays to realign business and investment practices to value long-term prosperity. The global economy can no longer afford "business as usual", focusing on short-term gains and ignoring long-term risks [15].

According to several authors firms will have to abandon the traditional strategy, focused essentially in profits and financial performance, and present an alternative vision that pays attention to the interaction with diverse stakeholders, to their interests and to the environmental impact of their activities according to a *triple bottom line* (TBL) approach by measuring, analyzing and reporting simultaneously the social, economic and environmental performances of the organizations [16] [17] [18] [19] [20].

However, some questions remain without any conclusive answers.

How to be sustainable and how to see sustainability in the context of information society?

Which are the main features of the information society?

Information and knowledge society is the one in which the basic support of all activities carried out are information and the knowledge. The information is transformed into productive action. The economy increasingly depends on the generation, management and distribution of information through global and inter-connected networks such as the Internet, providing the creation of a myriad of small and micro markets, not controlled by organizations but ruled by consumers [21].

Some of the key drivers of the information and knowledge society are the following [22]:

- Digital services at anytime and anywhere;
- Distributed and mobile workforce;

- New computational tools;
- Outsourcing† of activities;
- Electronic commerce‡ (e-Commerce);
- Automatization of operations;
- Strategic use of ICT§ for achieving competitive advantages;
- Organization's extension as an organizational model.

The power and influence of people and consumers is much greater today, influencing markets, businesses and the society. The asymmetries generated with the "easy to get and use" of information can quickly and drastically change the established balances.

On the other hand, the majority of studies and theories focus essentially in "*how*" to measure the organizations sustainability and "*how*" to translate these measures into understandable, suitable and instructive information for the several traditional stakeholders.

The *DPOBE Model for Organizational Sustainability* tries to identify major questions regarding the organizational sustainability, focusing itself in the joint of several agents such as the management of human and organizational resources and markets efficiency, in order to guarantee organizations consolidated continuity in society [23] [24].

It has already been applied in two empirical studies based on major Portuguese enterprises [25] [26].

This model is supported in five pillars that are referred as the most important in the frame of the organizational sustainability and in which managers should develop abilities:

- Direction, regarding the economic sense that must be given to organizations, the capacity to conceive the future and find the best way to achieve it, the capacity of strategic innovation to facilitate "business new conception", forcing management to consider in a permanent way "different forms of playing the game in today´s businesses" [27] [28].
- Posture, with management conducted by ethical values which will give to organizations credibility and respect, acting with reliability to induce positive attitudes and critical behaviors that will help organizations to reach high performance, based on confidence and upon new ideas in order to guarantee their share in a fair and balanced society and economy [29] [30].
- Organization, an essential activity in management providing a multi-dimensional and multi-contextual answer to deal with so many different organizations, information systems, support technologies, necessities and objectives in different economic contexts, with the alignment among strategies and the organizational dimensions, responsibilities and performances as a central key in the information economy [31].
- Behavior, with quality as a rule of organizations, with all activities developed following strict standards of quality according to patterns of efficiency and effectiveness, with quality as an instrument to control organizational functioning in order to answer to well-defined strategies and to reach their sustainability [34] [35] [36] [37].
- Evaluation, a procedure to analyze the organizational performance according to the defined strategic options and objectives, requiring the management of the organizational systems and the performance and

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† "Outsourcing" can be understood as the relationship between a supplier and a consumer or customer, in which the supplier takes responsibility for one or more client functions [32].
‡ The equivalent terms "*e*-Commerce" or "online activities" mean any services normally paid at a distance and provided by means of electronic equipment for processing, involving data store and made at express request of the recipient of the service [33].
§ Information and Communication Technologies.

risk of activities, allowing a quick access to a large and accurate set of information in order to make mobilization of capacities and resources for problems and critical opportunities [38] [39] [40].

Fig. 1. The DPOBE Model for Organizational Sustainability (Gisbert López *et al*., 2010; 2011)

3. A Proposal of Information Systems Requirements

This theoretical approach to information systems requirements according to the DPOBE Model involves the identification of "key elements" to be measured by a proper evaluation of the organizations´ sustainability.

For this propose the authors used the focus group research technique, joining academic researchers in the fields of management and information systems with professionals from the areas of software and operative systems development and information systems administration in the public sector.

Focus group technique is a powerful research tool that can provide not only uniquely valuable insights but also rapid and suitable collection, integration and assembly of different points of view from a wide range of stakeholders around a conceivable theory [41] [42].

For this proposal, it seems crucial to raise some questions in each step of the model in order to suggest several dimensions and parameters to be analyzed.

To rate each one of these items we propose the use of a Likert scale with values between the lowest (1), which correspond to a total lack of the dimension/parameter under analysis and the highest (5) that correspond to an objective and clear reference of it.

In accordance with each pillar of the DPOBE Model:

- Direction

Mission – Is the assumption of the challenges of Information Society evident in the organization's mission?

Vision – Has the organization a clear view of the impacts of these challenges in future activities, products and services?

Objectives – Are the objectives concrete, temporally defined and quantified to the Information Society?

Strategies – Are there clear strategies in this area?

Policies – Are there organizational policies designed to encourage this development?

- Posture

Policies – Are there organizational policies designed to encourage this development (security and contingency plans)?

Responsibilities and Tasks – Are the roles and responsibilities of the different organizational elements in this area clear, particularly those linked to IT?

Ethical and Conduct Codes – Is there any kind of conduct code clarifying the duties and obligations with stakeholders, guiding the practices considered appropriate, particularly developed in this area and in the field of IT? Is it a public conduct code?

Satisfaction Indexes – Are satisfaction levels defined for internal and external customers, regarding developed processes and the services provided through the IT?

Complaints – Are complaints relating to IT services and systems, as well as associated services, properly analyzed?

- Organization

Functional Structure – Does the existing structure cover an area dedicated to design, development and management of the information systems?

Governance – Is there any practice of IT/IS governance which includes financial, planning, project, process and talent management?

Architecture by Processes – Is organizational functioning based on a process approach, with emphasis on information and respective support systems?

Architecture of IS/IT –Is there an architecture for Information Systems and Information Technologies clearly defined and recognizable?

Innovation Management – Is there a regular use of ICT in the product innovation process and portfolio services?

Customer Interaction – Are there multiple channels available to communicate with customers?

- Behavior

Quality – Are there quality standards of service, in particular through the IS / IT?

Service Levels – Are there specifications for service levels provided by the organization to each functional areas?

Customer Relationship – Is there a comprehensive framework to manage all the information related to the customer´s life cycle?

Training – Are there training policies to adapt employees facing the challenges of the Information Society?

Project Management – Is the development of activities and problems solutions usually guided by principles of project management?

Key Performance Indicators – Are there key performance indicators (financial, operational, customer service, human resources, security…) associated with different departments and services?

Audits – Are there audits on information systems to evaluate their functioning, suitability and integrity?
- Evaluation

Satisfaction Levels – Are there defined satisfaction rates available to services and information?

Portfolio Applications – Do IT use portfolio applications? Does it cover all organizational structure? Does it reflect business operating model changes?

Measurement Tools – Are there tools to measure organizational performance and IS/IT (Balanced Scorecards, *Tableau de Bord*, dashboard…) and do they include risk and value measurement?

Activities Reports – Are there activity reports related to business plans set out each year?

Improvement Plans – Are there improvement plans?

4. Conclusions

Organizational activities must observe a set of rules to guarantee the credibility of actions and the responsibility of behaviors and decisions in the context of information society.

Analyzing the matter of corporate sustainability in the information society it changes their actors from simple economic agents into active "players".

Without focusing other sources and criteria widely demonstrated and used in the domain of organizational and enterprise sustainability, considering the economic, social and the environmental scopes in a medium and long term perspective, there are several dimensions and parameters that the authors consider to be fundamental and in which managers and organizations must improve their knowledge and develop competences.

There is, however, the need to emphasize some aspects from the present theoretical proposal.

An effective application of the DPOBE Model for Organizational Sustainability to information society issues is possible after this model can be tested and analyzed in organizations. The authors think that this proposed approach tries to evidence a set of factors that could be representative and illustrative of a similar behavior pattern, of key-conditions and management skills required for the organizations´ sustainability.

In the future, there will be the need to develop some studies around this subject aiming to validate this application of the model, adjusting or changing it if necessary according to new aspects and characteristics that may be considered as relevant to a deepen knowledge on organizations that aims to follow sustainable strategies in the information society.

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