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THE ROLE OF CORPORATE SOCIAL RESPONSIBILITY IN THE SOCIAL INFORMATICS

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Nota Introdutória

A Escola Superior de Tecnologia e Gestão (ESTG) do Instituto Politécnico da Guarda IPG) congratula-se pelo facto do Professor Doutor *David Crowther*, da *London Metropolitan University*, Reino Unido ter aceite o convite para realizar uma visita de trabalho e investigação científica a decorrer entre os dias 9 a 15 de Novembro de 2002. Temos a certeza que com esta visita será possível desenvolver um debate privilegiado entre toda a comunidade Docente e Discente.

É igualmente um enorme privilégio dar início à série *Estudos e Documentos de Trabalho* com seis *paper*s da autoria do Professor David Crowther. Esperemos que este seja o estímulo e o incentivo que falta para que, em particular a comunidade académica da ESTG, apresente trabalhos científicos que estimulem a discussão científica.

Não se poderá deixar de agradecer à Fundação para a Ciência e Tecnologia que, através do Fundo de Apoio à Comunidade Científica, generosamente aceitou a nossa candidatura, bem como todos aqueles que directa e indirectamente contribuíram para a sua concretização.

Constantino Rei
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The Role of Corporate Social Responsibility in the Social Informatics

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Abstract

Purpose – This research explores the 'social context' of informatics, characterized by incentive systems for using, organizing and sharing information in firms and others organizations. Actually, many aspects justify the evolution of social informatics framework and the development of the corporate social responsibility (CSR) behaviour.

Design/methodology/approach – Inside the international framework of the European Union (EC, 2001), this research analyzes the interrelationship between corporate social responsibility and social informatics, centring in those aspects that influence more the firm activity, for example the information and communication technology (ICT) costs. Specifically, the CSR stimulates the knowledge sharing in firms and improve the professional practices in accordance with of sustainable development and the effective execution of its social, environmental, ethical and corporate governance priorities that satisfy the needs of different category of ICT stakeholders.

Findings – Exist new concerns and expectations from citizens, consumers, public authorities and shareholders in globalisation context and large scale industrial change. Social criteria increasingly are influencing the investment and financing decisions of firms and institutions as well as of the consumers. As stakeholders/shareholders the increased concern about the damage caused by economic activity to the environment; and transparency of business activities brought about the media and modern information and communication technologies are the main concerns.

Practical implications – This research shows that practices of firms in the field of social informatics and managerial judgments are aspects of their decision making process. But, these aspects recognize needs and social responsibilities of a stakeholders range to promote the dynamic, prosperous and resourceful service science.

Originality/value – The basic question is that ICT costs will answer to the impact of social informatics in business management that is closely related with economic conditions.

Key Words: CSR, Social Informatics, ICT Costs, Service science.
Paper type – Research Paper
JEL classification: M14 – Social Responsibility, M41 – Accounting.

1. Introduction

This research explores the 'social context' of informatics, characterized by incentive systems for using, organizing and sharing information in firms and others organizations. Actually, many aspects justify the evolution of social informatics especially those related with the corporate social responsibility (CSR) behaviour (Simon, 1975; Lamb & Sawyer, 2005).

The growing of operations firms', including the multinational phenomenon characterized by globalization of markets and internationalization of firm activities, needed an interdisciplinary approach that combines business, accounting information, engineering knowledge and social science. Therefore, this research shows that practices of firms in the field of social informatics and managerial judgments are aspects of their decision making process (Kling, 2000; Davenport, 2005). But, these aspects recognize needs and social responsibilities of a stakeholders range to promote the dynamic, prosperous and resourceful service science.

Service science is a term introduced by IBM to describe service science as an interdisciplinary approach to study, design, and implement services systems in which specific arrangements of people and expertises take actions that provide value for others (Kling & Star, 1998). More precisely, it has been defined as the application of science, management, and engineering disciplines to tasks that an organization beneficially performs for and with another (Larson, 2008). Then, as the Lisbon strategy defends (EU, 2008), modernization of higher education is crucial to the knowledge triangle (education, research and innovation).

In a society of intensive knowledge, the demands in relation to the landing of qualifications and competences grew considerably, carrying out the formation/education, in general, and the one of the higher level, in particular, a strategic function (Abreu et al., 2007). In effect, for Davenport (2008) several higher education institutions promote this subject; being the ESTG-IPG and Oporto University, Portuguese examples that have pioneers courses to their students in the social informatics topic. As Silveira et al. (2007) states, society tries to create dynamics to develop knowledge, very different from the past, when knowledge was a secret.

In recent years, the service science conjoins the relations between corporate social responsibility and social informatics. It is centred in those aspects that influence more the firms' economic activities, in general, and the information and communication technology (ICT) costs, in particularly. In essence, it represents the significant role in influencing the ways that people use information and technology, not only the consequences of use but also the understanding of business processes and organization (Tang, 2000; Paulson, 2006). So, service science is a multidisciplinary field that brings together knowledge from diverse areas to improve several services industry's operations, performance, and innovation (Miles, 2008).

Following this, the CSR behaviour stimulates the knowledge sharing in firms and improves the professional practices in accordance with the sustainable development practices and the effective execution of its economic, social and environmental functions that satisfy the needs of a different stakeholder's category. But, Unerman & Bennette (2004) explain the

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difficulties in identifying all stakeholders that are affected by a firms' activity. And in this perspective, Heard & Bolce (1981: 248) explain that some stakeholders act as pressure groups that increase influence the social report of firm:

> *have been instrumental in calling attention to issues such as product quality and safety, environmental protection (...) have had a substantial impact on the development of social measurement and social reporting.*

This report assumes that the ICT challenger of firms to be fully understood must through socio-technical perspectives where contest is conceptualised in terms of interdependent and multi-level (Rowlands, 2006). This research presents the findings of an empirical study that has investigated the ICT costs (Horngren et al., 2008). However, the concern to list exhaustively all the costs underlying the system and its methodology: direct, indirect, basic, real, standardized, fixed, variable, relevant, irrelevant, marginal, differentiable, controllable and not sunk, would make this task impossible to achieve. Consequently, it will be the most detailed, while the extension of focus could be affected because of a wide range of areas, such as: the internet expansion, the telecommunications development and new ways that people found to interact with each other, social networks and the global perception that led to the development of the ICT and the concept of social informatics (Karamuftuoglu, 1998; Wang et al., 2007).

The paper is organized as follows. The next section discusses the social informatics and explores the consequences of CSR practices. The third section also puts the corporate social responsibility in perspective, that is, analyses its role in the ICT costs. Finally, the last section shows the findings of the research.

2. Social Informatics

The authors cannot present a definition of social informatics, since there are many factors that interfere in it. Then, it will be introduced some aspects that share the idea of this concept and its origins that are inside of the information technologies (Kling et al., 1998). As an adaptation from the proposed concepts of Kling since 1980's, it is presented several of them made by researchers in the period of 1980 till 2008. These concepts emphasis aspects of the social responsibility and show the growing recognition that values, ethics and behaviour of firms, citizens and the society can have (positive and/or negative) impacts in the ICT.

In this sense, social informatics is rapidly emerging phenomenon within the ICT. Kuriyan et al. (2008) defend the ICT as instruments of sustainable development, being used to assist in social development. Inherent to this, the authors defend the existence of the three basic CSR principles (e.g. sustainability, transparency and accountability). Crowther & Rayman-Bacchus (2004: 239) argue that sustainability:

> *... is concerned with the effect which action taken in the present has upon the options available in the future. If resources are utilised in the present then they are no longer available for use in the future, and this is of particular concern if the resources are finite in quantity.*

Transparency, according to the concept proposed by Crowther & Rayman-Bacchus (2004: 241) is:

> *the external impact of the actions of the organization can be ascertained from that organization's report, pertinent facts are nor disguised within that report and can be seen to be a part of the process of recognition of responsibility.*

And accountability, according to Crowther & Rayman-Bacchus (2004: 240), is:

> *concerned with an organization recognising that its action affect the external environment, and therefore assuming responsibility for the effects of its actions.*

For this reason, there is a wide amount of debate in the literature over what constitutes social responsible practices and what defines social responsibility, and consequently social responsibility of informatics. Thus, social responsible practices are not merely discretionary and desirable activities. They are necessary imperative, thus social informatics researchers, professionals and, in general, users of computers are interested in questions about the future consequences of information and technology (IT) developments.

In effect, since the development of IT and the use of web-based information system by firms, business management methods have become more sophisticated, leading to significant changes in business models (Liu & Tsai, 2007). According to Sawyer & Tapia (2007), changes come about in institutional environments when some event or development breaks the patterns established by previously recurrent actions and reflexive behaviour of individuals. In fact, as business environment changes and competitiveness grown they demand more social responsible practices and the accomplishment of the CSR principles. For Chang & Chow (1999), these changes result of a confluence of factors, including communications technology and structural changes in business organizations and processes (e.g. downsizing and reengineering). This research focuses the ICT costs as an empirical analysis as Kling (2003: 2656) explains that:

> *one of the key concepts of SI is that IT is not designed or used in social or technological isolation. From this standpoint, the social context of IT influences their development, uses, and consequences.*

According to Sawyer & Eschenfelder (2002: 428), the definition of social informatics, published in the *Annual Review of Information Science and Technology*:

> *(...) is the term we use to represent a field of research focusing on the relationships between information and communications technologies and the larger social context in which these ICTs exist. Contemporary social informatics work spans issues of design, implementation, and use of ICTs in a wide range of social and organizational settings. This body of research includes analyses of the impacts of the social and organizational settings on the design, implementation, and uses of ICT, including the intended and unintended social and organizational consequences of ICT-enabled change and change efforts. Thus, social informatics research focuses on exploring, explaining, and theorizing about sociotechnical contexts of ICTs.*

Kling (2003: 2656) publishes, in the *Encyclopedia of Library and Information Science*, one definition of social informatics saying that:

> *(...) the systematic, interdisciplinary study of the design, uses and consequences of information technologies (IT) that takes into account their interaction with institutional and cultural contexts. Thus, it is the study of the social aspects of computers, telecommunications, and related technologies, and examines issues*

> *such as the ways that IT shape organizational and social relations, or the ways in which social forces influence the use and design of IT.*

However, Kling (2007: 205) presents a more formal definition, that is:

> *the interdisciplinary study of the design, uses and consequences of information technologies that takes into account their interaction with institutional and cultural contexts.*

On the other hand, Sawyer (2005: 9) details that, the definition of social informatics:

> *is the term that I and others use to represent the trans-disciplinary study of the design, deployment and uses of information and communication technologies (ICT) that account for their interaction with institutional and cultural contexts, including organizations and society.*

Other concepts to the same definition of social informatics are presented, such as: 'social computing', 'sociable media' and 'social software' that have attached to additional established fields of computer-mediated communication, computer supported collective work and human-computer interaction. In these fields, the same trend of definition is also followed by Halavais (2005: 13):

> *Social informatics aims to understand the relationship of technological systems to social systems.*

The concept of *social informatics* could lead to confusion for many and with good reasons. *Information* is sometimes used interchangeably with *information science* that is used to describe ways of managing information and making it available, often to a firm (Halavais, 2005). One may suggest toward the context that helps to distinguish social informatics from other information science work that focuses on individual behaviours and/or draws on theories rooted in, for example, economics, computer science, or psychology (Sawyer & Eschenfelder, 2002). According to Glushko (2008):

> *Service science is not merely interdisciplinary; it must be transdisciplinary - bringing together different perspectives to span the boundaries between them.*

All these definitions generate a relatively consent in third aspects. In the words of Day (2007: 576-577), the first aspect:

> *is an emphasis upon a determinative, causal model between social forces and computers (or information technologies or information and communication technologies), on the one hand, and ICTs and social forces, on the other hand.*

This fundamental aspect centred in the field of the computer and the human providing a corporate social responsible behaviour that has a voluntary nature and that this behaviour should have. The voluntary nature is always discussed and explained in the research knowing that each institution produces services to the society that used them. In this new business model, the spirit of cohesion, the value of social capital, collaboration networks, and relations based on trust and practice communities are the essential springboards for development (Carneiro, 2006).

The second aspect to Day (2007: 576-577):

> *is an emphasis that is placed on social informatics as empirical and "problem-driven" (...) and by the reference to the "problem-driven" we may expect that*

> *social informatics analyzes particular problems toward arriving at solutions that resolve those problems. This wording suggests that social informatics is "practical," as opposed to being "just theoretical".*

In this research, the basic question of the ICT costs will answer to the impact of social informatics in business management that is closely related with economic conditions. So, the value of this information in the right moment increases when there is uncertainty (Williamson et al., 1975). Also, the informatics technology costs may increase the development of a system. These enable the need to make estimates and discuss the fundamental aspect of determination. To achieve this, in the accounting approach and specifically the accounting management can find different concepts/methodologies that allow us to quantify the problem and then decide.

And, as thirdly aspect, Day (2007: 575) discusses critical analysis associated with social informatics, so this importance:

> *is to bring into question established social assumptions and values regarding information and communication technologies (ICTs) and established understandings of "information", particularly as they play themselves out and are institutionalized in social and professional discourses and professional training.*

Effectively, the present generations are living through a period requiring a social and institutional intense creativity. And according to Perez (2002), humanity is now at a 'turning point' in the latest technological revolution. The period of establishment of the ICT that has taken place over the past thirty years – with its sequels of 'creative destruction' and generalisation of a new social paradigm, the information and knowledge society – could be followed by a period of implementation and prosperity of the full potential of the new triumphant paradigm. According to the researcher's analysis, the intermediate period in which we live – the 'turning point' – is marked by instability, uncertainty, the end of bubbles of speculation and institutional reorganisation.

The ICT revolution is now entering in a new development period and its power to increase productivity and facilitate innovation spreads to all other industries. As Wang et al. (2007: 82) concludes:

> *the move from social informatics to social intelligence can be achieved by modeling and analyzing social behavior, by capturing human social dynamics, and by creating artificial social agents and generating and managing actionable social knowledge.*

In fact, this Knowledge, designed as knowledge management (KM), is related with knowledge infrastructure capacity and knowledge process capacity, and has a significant effect on firms'. According to Liu & Tsai (2007: 735):

> *knowledge infrastructure capacity consists of technology, infrastructure use and culture, whereas knowledge process capacity consists of knowledge acquisition, modification, and the capability to project.*

All these should be the basic approaches that allocate the firms to develop efficient production processes, improving the business environment and competitiveness, as well as increasing the organizational profitability.

Thus, it is time for future network models represent aspects of the reality, included the social context and to each person as an economic agents' beliefs, goals, and intentions. Because any specific network representation is an abstraction of the real society, is equally important to find the proper level of abstraction to fit the intended applications. The authors consider that concept of abstraction relates to the idea of hiding data that are not needed.

3. The Role of Corporate Social Responsibility in ICT Costs

The CSR is understood, as the Green Paper (EC, 2001: 4) proposes, as:

> *a concept whereby companies decide voluntarily to contribute to a better society and a cleaner environment.*

By other way, the Communication from the Commission of the European Communities, about the *Corporate Social Responsibility: A business contribution to Sustainable Development* (EC, 2002: 3), emphasizes:

> *a concept whereby companies integrate social and environmental concerns in their business operations and in their interaction with their stakeholders on a voluntary basis,*

the authors consider that this voluntary commitment going for besides their legal obligations. So, as Jensen & Meckling (1994: 1) argue:

> *understanding human behaviour is fundamental to understanding how organizations function, whether they be profit-making firms in the private sector, non-profit enterprises or government agencies intended to serve the public interest.*

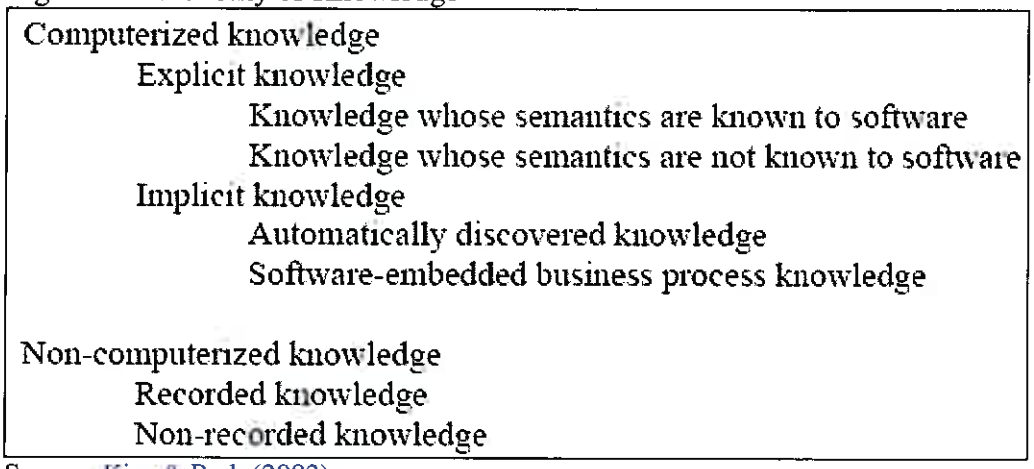
Furthermore, the question of public interest is not standardized and therefore cannot be simply represented because many factors are inhibiting to the knowledge transfer. The main factors could be the lack of trust between stakeholders, differences in culture, languages, and the lack of time and availability for this knowledge transfer truly happen. Although, Davenport & Prusak (1998) have presented several solutions to these problems, such as: building a network of contacts that promotes confidence among stakeholders; evaluate and reward those who share and reuse knowledge; overcoming differences creating consensus through the training and work together; and create availability and appropriate forms for the knowledge transfer, such as promoting colloquiums, conferences and meetings. In this sense, the question understands the implications of the knowledge engineering (KE), which has been defined by Feigenbaum & McCorduck (1983: 2) as:

> *an engineering discipline that involves integrating knowledge into computer systems in order to solve complex problems normally requiring a high level of human expertise.*

According to Kendal & Malcon (2007), KE refers to the building, maintaining and development of knowledge-based systems. Llorens & Prieto-Díaz (2003) explain that knowledge engineering intends to 'dominate' knowledge in order to allow computers help humans solving problems. KE and KM certainly manage knowledge; they are focusing on different and complementary aspects of it. KM is more of an enveloping discipline that deals with several areas applying a variety of techniques, with the main intention to 'administratively manage' knowledge. It is this complementary viewpoint that we want to emphasize in our explanation of the proposed concept of science of knowledge (KS). This

concept has defined by Llorens & Prieto-Díaz (2003) as the merging of Domain Engineering (DE), Information Engineering (IE), Software Engineering (SE) and Knowledge Engineering (KE), all of them "moderated" by Knowledge Management (KM). Thus, to understand this concept and influence, Kim & Park (2003) presents the taxonomy of knowledge in Figure 1.

Figure 1: Taxonomy of Knowledge



Source: Kim & Park (2003).

Knowledgebase economy is a major driving force for the economy and society of industrialized nations (Kim & Park, 2003). So, it is disaggregated in computerized and non-computerized knowledge. Thus it is important to pay attention to do not spend extra effort in designing and constructing additional functionality (Coplien & Schmidt, 1995). Before introducing the ICT costs, it was showed that it is possible to capture all the taxonomy of knowledge with significantly less effort by using a more compact pattern format. For this reason, information technology, both computer hardware and software and communications technologies, is at the core of knowledge-based economy. The dynamic 'knowledge-based economy' requires modernisation and coordination of professionals and organizations, which monitored the development (David & Abreu, 2007).

In this environment, for Rodriguez (1996) the firm needs to make an investment in ICT with a feasible interrelation of the surrounding environment internally and externally. By this way, the firm could get new opportunities, for example deaf and hearing-impaired people need special ICT that must be develop to support their social inclusion, then the firm will avoid dangers of wrong investments . The firm considers having an ICT, among others, the following aspects:

1. Utility in decision-making;
2. Sources reserve of information;
3. Channel of communication;
4. Processing System; and,
5. Management of costs.

As an adaptation of the proposal of Aguilera et al. (2008: 476) methodology, the main concern related to ICT costs refer to the value of inputs to social informatics, such as compliance with existing regulations or opportunity costs of managing relations with shareholders. These costs will vary for different system or technology, as well as of different environments. So, cost benefit analyses are rarely universal.

Firstly is the total cost of ownership. This concept is widely used by engineers, systems and wishes to calculate the costs (and benefits) of the organizations that use information technologies. This task is not easy, because it may involve costs as divergent as: equipment, through installation, configuration, training, management, use, maintenance and monitoring systems, and all that, directly or indirectly, contribute to its implementation as: process of selection, purchase, payment and even the replacement. However, this classification or not be as extensive, limits their study.

Secondly is the ICT cost. It is often used by experts in the accounting management perspective. Then look for, it is developed a new methodology supported in a proposal advocated by Stiglitz (1975) and Rodriguez (1996) in which ICT costs may include costs such as:

1. Research.
2. Implementation.
3. Monitoring.
4. Contingencies.

Research costs

In the estimation process of the ICT costs, the authors must start to evaluate the research costs. All those specifically include on the following four stages:

Stage 1 – Alternative analysis in the ICT market.
Stage 2 – Global evaluation.
Stage 3 – ICT selection focus on the appropriate objectives of the firm.
Stage 4 - Future implementation within the firm.

Hence each one of the four previous phases, it can be detailed the following costs:

- Human Resources, which can be engineers, systems and/or area of the system to be implemented, including: wages, social security, transport, events, travel, the benefits provided by law (extra hours, allowances for food, home and vacations) and additional released by the organizations (cap credit card, phone, car, among others).
- Goods/Services needed to perform their duties and tasks, such as specialised work, administrative and computer equipment, rental of space and office supplies.
- All costs that must be contained in the functions of collection, analysis, selection, communication, processing and presentation of conclusions of investment projects.
- How involves a decision, the firm should include the opportunity cost, that is, the decision to implement a given ICT, implies the rejection of other systems or even not have any system.

In fact, associated with this Stage 1 should also have the risk analysis that follows consideration of the uncertainty associated with the decision of the ICT implementation.

If by chance a call for a subcontracting firm specializing in the business of exploration and evaluation of ICT, it should consider the cost of: advertising the need for the study, the selection of the firm that go to develop the project, the contract and all inherent in this situation (litigation, financial, extraordinary and even the unexpected).

The new information and communication technology supported by innovative technical areas, sophisticated hardware and software, new processes, organization and implementation of functional structures of channels of information for the purpose of disclosure, safeguarding the integrity of their assets, preventing and detecting errors, fraud and omissions have higher levels of costs that are weighted in the investment and financing decision. Moreover, time and energy are other aspect, which is probably the more significant, no one can fail to mention that the classification and/or the standardization of the ICT cost has to contend with some difficulties in implementation, mainly by the high number of concepts that use abstraction and artefacts.

Implementation costs

The authors can not fail to mention the demand for estimates at this stage to search for the implementation costs. These will be developed and integrated into three main tasks of the review and evaluation of investment projects, namely:

1. investment decision with two components of intangible and tangible assets (e.g. license cost) and current assets (e.g. suppliers of equipment);
2. financing decision with negotiation between alternative financial market (e.g. lease) and specific assets (e.g. operating lease), charges of trading and opportunity cost; and
3. current expenses and revenues that allow to implement the ICT in a firm, specifically:

   i) Human Resources, including:
   - Analysts, involving interviews, preparation of reports, documents, studies, preparation of procedures, the system tests, inspections, reviews, training, consultation with stakeholders, experts, programmers, supervision, design documents and formal presentation.
   - Programmers: coding, debugging, testing, reviews, personalization of programmes and consultations with analysts.
   - Traders: conversion, training, support programmer and consultations with analysts.
   - Administrative Personnel: conversion, training and consultations to analysts.
   - Control: monitoring and consultations with analysts.
   - Expertise in different fields, as well as, in the field of the detail ICT.

   ii) Goods and/or Services, namely: acquisition, installation and upgrading of hardware and software, with tests of acceptance, utilization of existing equipment, conversion of files, tests the system and, consumables (publication of manuals and procedures, paper, forms, Diskettes and CD) and an insurance policy.

   iii) Committee, for example, costs of interruption of processes and procedures in the firm, the management and administrative support and external, among others: consultancies, audits, specific training, and preparation of the circuit documentation, correction monetary, exchange rate differences, processes and legal procedures.

   iv) Space, that is adapting and/or change of control of access to facilities and offices, systems, electrical infrastructure, maintenance of environment (heating, cooling and levels of humidity), communications (systems, and data lines), Security and surveillance (systems, technical and information), health and comfort.

v) Initialization of the process for all system stakeholders that if you can also break down into costs:

1. training, adjustment, retraining and upgrading specifically: specialized training for development of an area that may be new or just recycling, loss or destruction (intentional or not) of information and systems, psychological problems, aversion to change or difficulties of adjustment, loss productivity of the functions that are affected by changes.
2. goods/services, such as: tables of information, new equipment administrative (ergonomic desks and chairs), advertising, among others.
3. other costs, including all that may lead to a better adaptation of ICT in the firm, that is, number and size of projects given the size of the firm, extension of time to stop or causes planned downtime (such as repair, upgrade and add new components of hardware and software, backups and redundant investments in components) presentation and communication to the inside and outside the firms' implementation of ICT.

Moreover, in the ICT costs consider the implementation costs. This should seek to match estimates of the costs above forecast. However, you can find deviations (positive or negative) in the face of reality. In an approach, NASA (1995) believes that the cost of implementation:

- must not exceed 2% of the cost of development or maintenance of software;
- line and human resources dedicated to the technical and analysis should range between, respectively, 3% to 7% and 5% to 15% of the total estimated value.

Monitoring costs

The ICT costs involve treating the monitoring costs that correspond to the costs of operation and maintenance of the system in continuous operation. In this context, costs involve:

- *Hardware/software*, for example: management, maintenance and time of use of systems, main memory/secondary, printers, networks, accessories, devices and entry and exit.
- *Human resources*, such as: administration, system engineers, programmers (maintenance), operators, administrative and security.
- *Goods/services*, such as: paper, diskettes, inventory, copies and support, security and space (offices), advice and audits.

In addition, the monitoring costs also cover the quality costs. This joins the system of quality assurance and the ICT-type situations: 'doing well at first', 'preventive and avoid breakdowns', 'reduce unnecessary costs', 'manage in an optimum manner' and the 'principle of excellence'. These costs are associated with:

1. *Prevention,* this includes planning procedures, formal technical reviews, building up teams and their training. These professionals know about organizational complexity, systems theory, human factors, professionalism, error recognition, management and prevention (Walton & Elliott, 2006).
2. *Evaluation*, including the situations of inspection and audit procedures, tests and cooperation in dynamic and multidisciplinary team.

3. *Deficiencies* in the system, involving the costs of errors that can be divided into internal and external. In the first is to review and repair the errors of the system, while the latter result of complaints from stakeholders that involve different forms of action (replacement of components and returning the system, operation and support of the security line of support).

Contingence costs

The ICT costs analysis also considers the contingencies costs. These costs are all costs related to situations of risk or conditions of uncertainty (extension of data, accumulators for the current deficiencies in the supply of electricity). Made an adaptation of Aguilera et al. (2008: 476) definition, contingencies:

> *refer to how social informatics interrelates with variations in internal and external resources.*

The source of costs is the management accounting system. When the costs estimation has been completed, the last ICT costs are associated with the costs of unforeseen situations, especially measured in time and value. This classification is not planned, relating to errors, fraud, omissions and failures in the selection, implementation, development and monitoring systems, market changes, changes in macro-economic variables, causes unplanned downtime (e.g. earthquakes, lightning, and situations of instability, crises and strikes) and the actual life cycle of systems.

Indeed, the balance of costs is crucial because the investment required for any firm represents a great effort. Thus, the methods of calculating these costs are important and should be realistic and demanding to special techniques. For that, the role of management accounting in the organizational information system is more and more indispensable; with an essential contribution during the several stages of the decision process. In this context, it is management accounting that provides the production and disclosure of information about costs and the economic and strategic benefits of the management politics adopted in the organization. Management accounting have the important role of supplying fundamental information to customers, shareholders, among others users (Costa, 2006), as for example the ICT system users'.

4. Conclusion

For a long time social, environmental, ethical and corporate governance priorities has been increasing role in the strategy of firms, but there are not universally agreement level of social responsibility for each initiative. Indeed, a way to evaluate the growing of operations firms', including the multinational phenomenon characterized by globalization of markets and internationalization of firm activities, needed an interdisciplinary approach that combines business, accounting information, social science and knowledge engineering.

Currently, the knowledge engineering and ICT development continues to grow in complexity. Therefore, expertise in this development have to work with increasingly social informatics concerns, different levels of abstraction and this is possible, because analysts are able to express ideas, co-create and connect this complexity.

Now, where everybody interacts socially, it appears that the future revolutionary industries are likely to be some combination of social and innovation aspects. Also, in the perspective of knowledge and social informatics, people manage innovation and then they create value through the new technologies. So, firms will develop integrated corporate social responsibility strategies that increase the level of firms' opportunities.

Following this, the authors purpose through the adoption of the CSR principles (e.g. sustainability, transparency and accountability), influenced positively the debate related with the adoption of the knowledge science concept by firms and citizens, in relationship with the knowledge engineering and the knowledge management. In the perspective of the information and communications technologies, always underlying the ethical values and the behaviours socially responsible, contributing for dynamic and innovative firms practices, promoting their excellence and the competitiveness.

Indeed, the efficiency and effectiveness of resources application depends of all us...

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