Rethinking Resource Scarcity: The Need For A New Paradigm In Economics

António Eduardo Martins, Felipa Lopes dos Reis, Open University, Portugal

ABSTRACT:

The constant evolution of society requires a continuous effort to develop new paradigms. The management of intellectual capital of organizations is of crucial importance. Presenting an update of the state of the art the present paper describes the general methodology that the researcher used to synthesize an intellectual capital model. The empiric study developed shows the relevance of a new explicative paradigm in economic science. The conclusions allow evaluation of the relevance of the study of intellectual capital for the management of organizations in the knowledge society.

Keywords: *Economic science, Intellectual capital, Knowledge economics, Knowledge management*

1. Introduction

Understanding how an organization develops knowledge is a prior condition to manage both knowledge and intellectual capital. Sharmer (2001) introduced the concept of "self-transcendental" knowledge; this is the tacit knowledge before its incorporation, namely, the ability to detect the potential, to see what doesn't exist yet. This is, generally, associated with artists e.g. Michelangelo supposedly said, about the sculpture of David: "David was already in the stone. I just took away what wasn't David". The ability to see David where the other ones just see stone is what distinguishes the truly great artists.

Indeed, the growing difference between the companies' stock market capitalization (their market value) and the value expressed in balance sheets reveal their respective intellectual capital. To some, this is an evidence of the emergence of information society where immaterial resources, more than material ones, are the sources of value creation (Drucker, 1993; Reich, 1991). The references of intellectual capital indicated in this study foreground the performance of intellectual capital in companies, clearly bringing forth this factor (Edvinsson e Malone, 1997; Lev e Zarowin, 1998; Stewart, 1997; Sveiby, 1998). Although the difference isn't explained, it is used to develop various notes or even autonomous reports beyond the financial annual report.

Brenann and Connel (2000) developed an interesting structure to compare different plans in the main classification, summed up in table 1.

Table 1: Plan Classification

Developed by	**Structure**	**Classification**
Sveiby (1998; 1997)	Intangible Assets Monitor	Internal Structure External Structure
Kaplan e Norton (1992)	Balanced Scorecard (weighted evaluation)	Personal Competency Business Process perspective Customer Perspective Learning and Growth Perspective Financial Perspective

Edvinsson e Malone (1997)	Classification of Sources Skandia Value Scheme	Relational Competency Human Capital Structural Capital

After all, many of the structures share the same three comprehensive classification categories – human capital, customer capital and intellectual capital. However, the classification of this plan is present, distinctively, in each one the identified models.

2. The Role Of Executives In Knowledge Management

Management is described as something which "has systematizing implications, supplying of structures, and contributes to the global coherence of the organization" (Addleson, "Organizing to Know", 200, 138). Other management attributes include coordination, control, integration and the handling of of people, processes and strategies for attaining a goal. In knowledge management, the main goal is to administer the tacit and explicit knowledge inside an organization. To manage explicit knowledge, organizations must:

- Generate, create or acquire knowledge;
- Encode and organize knowledge to ease its access;
- Make the knowledge available to the others through communication or internal publications;
- Provide access to knowledge and ease its recovery;
- Use and apply knowledge to solve problems, support decisions, improve performances, conduct and analyse situations and processes in order to sustain business activities.

Hence, the major role of information technologies (IT) becomes evident. Indeed, IT can be a powerful booster and provide effective and efficient tools to the many aspects of knowledge management, such as the acquisition, share and application of knowledge.

IT applications and its skills in searching, ordering, indexing, filing, selecting and conveying information may facilitate and improve the organization, ordinance, classification and broadcasting of knowledge. Such technologies, like the relational database management systems, document management systems, Internet, Intranet, web search engines, work tools, performance support systems, decision support systems (DSS), data improvement and storage tools, e-mail, videoconferencing, news circulation and group discussions can perform a pivotal role in order to ease knowledge management.

However, IT isn't inherently the core of knowledge management, likewise a project doesn't apply knowledge management just because it uses or includes IT applications. These are just a supporting tool in knowledge management; by itself, they don't promote knowledge.

While IT help individuals to locate information, people have to determine in what form the information is obtained and relevant according to their specific needs, therefore, they have to analyse, interpret, understand and locate the information in its context so it can be converted to knowledge.

Hereby, identifying a group of main guidelines has assumed great importance, namely the identification of markers in the human factor qualification and organizational change, if we aim to make the investments on information and communication technologies pay off.

In this matter, we follow the recommendation of Quinn (1991), who recognizes the need to study the organizational reality from several dimensions, paradoxically disposed, standing that business management reveals itself a polarized dichotomy which is difficult to describe, both by theory as by practice. The process of knowledge creation (Nonaka e Takeuchi, 1997) comprises a key factor in the

innovation model which represents, in the age of knowledge, a competitive factor more and more relevant.

On the other hand, it can be asserted that the competitiveness of an economy relies upon the intensity of existing knowledge in a society which, on its turn, depends on the competitiveness of the education, science and technology system, and of the production system, also known as national innovation system (Gouveia e Teixeira, 2005).

The innovation, as the core of the knowledge creation process itself, of its essential elements, models and quantification, is a stronghold of our society, where the short life of business models, labour relations, social models and even of the nation-state seem to be definitely a reality. The study underlying this article is formed basically by various tools to collect information.

In the first place, questionnaires have been applied to several organizational agents included in the REDE Programme, implemented by IEFP (Institute of Employment and Vocational Training in Portugal) – which is a programme promoting Consulting, Training and Management Support to the SMEs under their Training to Small and Medium Enterprises Programme.

Thus, the REDE Programme is exclusively oriented to SMEs executives and workers (below 50 employees), with no regard to their economic sector or development stage. By turning to this data, we've aimed the creation of a work basis and the establishment of the main determinant vectors of performance to micro and small companies, which allowed us to consolidate a solid research line.

This questionnaire was analysed through SPSS software, and carried out in subsequent years (2002, 2003, 2004, 2005 e 2007). In 2006 it hasn't been produced any evaluation of REDE Programme's application and evolution, due to structural reasons outside our research. From these works, it has been prepared a questionnaire outline forming the basis to the quantitative study which was submitted to a pre-test, of which analysis pointed out some important aspects to the validation of the data collecting tool.

3. Research Problem

The evolution of Solow's paradox is fundamental to determining this research's context, that is, the difficulty to find a relation between the investments in information and communication technologies (ICT) and improvement of the work factor productivity, instead of what used to happen in the industrial age, when investment was almost always synonymous of productive growth.

By this mean, it can be systematized three main solutions of answering to these challenges of knowledge economy: the necessity of exponential raises of ICT, thus, the required training of individuals and, finally, the subsequent organizational change.

The overall literature allows us to formulate the research through the following parameters: how are the small companies managing his intellectual capital, according to the ITC investment they were forced to carry out and from which, being small and flexible, they don't have apparently to alter their organizational structure. Therefore, our goal was to study the existent relation between intellectual capital dimensions and organizational variables (training and changeover) of enterprises in the studied economic tissue.

4. Research Paradigm

By this mean, we intended to assert the extent of a methodology concerning intellectual capital withholding among micro and small companies, using for this purpose the primary data of REDE Programme, from IEFP, which focus precisely that reality.

In fact, we can see this growth in two forms. On the one hand, we identify growth through the application of REDE Programme, and in the other hand, the companies' organic growth. In empirical terms, a considerable platform of questionnaires is actually available, distributed by the correspondent

stratification and through a timeline covering the years 2002, 2003, 2004, 2005 and 2007. In these terms, works have been produced in order to extract conclusions about the variables innovation, continuous professional training, processes (since the reliable processes are the ones who encourage cooperation) en average quality measured by customer (which is a guarantee of reliability), through the scheme in Table 2:

Table 2: Quality Schema

Training ⇔ team	Innovation ⇔individual capital
Processes ⇔qualified personnel	Quality ⇔flaws

The debate on productivity is, long ago, a constant concern by academics and executives, coexisting peacefully the doctrine that reduces it to the work and capital determinants, with the permanent uncertainty about the predictability it needs, being work and capital both factors with known variations.

The theory of intellectual capital allows a complete response to this question, since the ultimate answer to this problem may be in the intangible assets field, which has been, long ago, in the core of organizational analysis.

This indicates a new productivity equation, formulated as:

$$\text{Productivity} \leftrightarrow f(\text{Capital; Work; Intellectual Capital})$$

Thus, diverse field work was performed in order to validate the key postulates underlying this theme, Quantification of Intellectual Capital in Organizations, and our research goals were:

- To identify the main and most influential determinants in knowledge management, beginning from the existing theoretical frame;
- Forthwith, through the analysis of a first questionnaire applied to Portuguese SMEs, we tried to isolate the knowledge creation and withholding vectors of that business universe.

By this we mean it was our idea to test and validate the following starting presuppositions:

H1) Team factor, importance given to customer, business processes and importance given to individual capital, are expected to assume a non-equal importance in the analysed sample;

H2) The importance given to individual capital is expected to assume a more significative importance whenever dealing with more qualified individuals in the areas of business and ITC, as we find a more balanced distribution.

In fact, as shown by Martins (2000), we can assert that our initial hypotheses presume that the main determinants of intellectual capital are related with a combination of factors: individual, team, customer and process.

The research method that we've chosen is constituted in three parts, providing by this a serial evolution of the research guideline. In a first stage, as said before, it was realised a documental analysis over the essayed problematization, aiming to consolidate the research theoretical basis and to make possible the approach to various research questions and hypotheses, attending, namely, to the diverse research that has been produced surrounding this theme. Next, by turning to case study methodology, it was realised the qualitative study, having allowed to identify a cluster of relevant variables, which were not highlighted yet. Afterwards, through the realization of interviews to experts (both in theory and practice) in this research area, we have proceeded to primary validation.

The quantitative study constitutes the third and last part of this research, having been performed, through questionnaires, an evaluation of the presented hypotheses and allowing the formation of a marker model for intellectual capital withholding in the organizations.

We've turned to case study methodology because it makes possible to preserve holistic and significant characteristics of real-life events, such as the maturity of the economic sectors (Ryan et al., 1992; Yin, 2005).

The general methodology is sufficiently efficient and flexible to deal with the diverse social realities, decision variables and usual restrictions found in Management Sciences area.

5. A Paradigm Change: Rethinking Resource Scarcity

Prior to 1980, the main management theories focused in industrial frames as a basis to understand the competitive advantages. According to neoclassical economies, it's supposed that resources can be homogeneously distributed within the industries and, on the other hand, easily available to competitive organizations.

However, the core of management is meant to find out clever ways of combining products and markets, fostering the balance of power with suppliers and customers, and thus promoting the assessment of the technological substitution potential along with products and/or services. The primary message of an economist's reasoning, inward an "industrial and organizational" structure view (Roos e Roos, 1997) alights in worshiping the environment, rather than the internal organization.

Incidentally, the studies (and models) proposed by Porter, so fashionable among the management schools, and even the strategic competitiveness models of Ansoff, place their main quality in the strategic position of the organization facing the environment.

In fact, the theories based in resource scarcity are losing their capacity to produce a global explanation, and entering into a crisis. Indeed, human resource assets are neither the same, strictly, as knowledge assets, neither a subset. Human resource assets measure the delivery of dynamic knowledge assets (submitted to rise or withering) through an individual. Thus, human resource assets can potentially foster a raise, but they are limited in his developing range.

On the other hand, a human resource asset can dwell an individual, group, organization, book or machine. Knowledge assets are more unchangeable, and they can unfold in a variety of delivering mechanisms. If the knowledge assets were captured in a specialized system, they can be, for example, applied in the improvement of another one performing the same task in the whole organization.

Human resource assets are evaluated, partly, by perspectives based in the employees' potential, in order to promote future discoveries and inventions, or to suggest innovations/improvements. Thus, it's common to see the human resource assets (measured by salary) being firmly appraised in the beginning of their careers. On the contrary, knowledge assets (at least the ones captured in a specialized system) are evaluated by the current knowledge they possess, and by their diffusion range. Unless we have any mechanism to reformulate and modify them, the knowledge assets are, frequently (but not always), steadily depreciated as time passes by.

The questions about ownership are also differently appreciated. In United States, the majority of employees desire to reverse their employment agreements when they compromise the employee's option of using their abilities to succeed in life. Knowledge assets can not belong, completely, neither to the organization, nor to the employee. Individual knowledge assets dwell the employee. Organizational knowledge assets, like books/manuals or specific systems are clearly property of the company.

The speed whereat knowledge assets can be applied varies substantially. When unfold by a human system of delivery, the speed of reasoning is controlled by the processing rate of human reasoning. When captured in a specific system, the speed of reasoning is limited by the inference efficiency of

motor/knowledge basis and by the computer's processing speed. When captured in books or manuals, the unfolding speed is limited by time spent in locating, interpreting and pondering over the information. These differences are summed up in the following table 3.

Table 3: Comparison between Knowledge Assets And Human Resource Assets

Knowledge Assets	Human Resource Assets
Economic life determined by the rate of occurred changes in the area	Economic life determined by their permanence in the organization
The company or the employees can be the owners	The employees are the owners
It can dwell in the organization and used by individuals, books, machines, etc. etc	Dwells in the use of a single individual
Capacity restricted to self-improvement, required maintenance	Possible active learning
Value determined by diffusion range and unchangeable base knowledge	Value includes prospective and retrospective components
Speed of use controlled by the conclusions system speed	Speed controlled by the processing rate of human reasoning

Source: António Eduardo Martins, 2008

The expression Knowledge-Based Economy (KBE), turned to a commonplace in latter years, states something emergent, about to happen, more than a consummated economical system. It contains, thus, a headstrong, apologetic element of wishful thinking, for what it's important, even in this knowledge matter, not to mix wishes and realities (Murteira, 2005).

The central position occupied by the industrial worker in the past is, in this typical and strategic economic category, nowadays occupied by the knowledge worker, with higher education, being himself, often, a manager of knowledge-intensive tasks.

6. Research Data

The frailties in the socio-economic constituted by the SMEs universe are well-known, being related to the fact that, as it happened in the Industrial Revolution transition (wherein the national companies fell behind in the modernization process), it weren't equally gathered, now, the conditions for the transition to the knowledge society.

In effect, it's common to say that Portugal had lost many chances, dropping behind the 19th century European countries. In many ways, this backwardness has become almost unstoppable.

In the beginning of 21st century, the training of small businessmen and their workforces seems to be the path necessary towards the knowledge society, especially if conjugated with the recruitment of young technical staff, better prepared to take advantage of new ITCs, which, if correctly mingled with traditional wisdom, should become a true booster to sustained growth. Some studies point that, even

among the top Portuguese SMEs, the value growth factors, measured by productivity and associated to the notions of Knowledge or Intellectual Capital, don't represent more than 20%.

A significant part of economic tissues – small, micro and medium enterprises – is confined, thus, to a traditional exploration of capital and work factors, like the Industrial Revolution times. Mechanisms of raising value to the national products are still roughly managed: a pair of shoes made in Portugal is sold, in London, at price three times lower than an Italian pair produced in the exact same factory.

Looking through another perspective to this reality, we could establish the huge growth potential of SMEs, hence they focus their activity in developing factors suitable with the knowledge society. The value growth among Portuguese SMEs is derived, according to our recent researches, from four main types of action, described next:

- Workplaces modernization with a correspondent recruitment of new technical staff, aiming to generate efficiency, processes liability and work reorganization, and allowing its update in view of an eventual unstable environment;

- Workforce training, not only over the technical know-how, but most of all in the relational and emotional levels, essential to the creation of teamwork spirit, in order to develop competencies and circulate know-how among all workers;

- Focus on quality, in order to cut flaws, monitor customers satisfaction and controlling complaints and returns, aiming to reinforce customers and partners loyalty, trying, altogether, reach the zero-error.

- Focus on products and market development, with the collaboration of individuals embraced in critical spirit, debate, incident analysis and continuous improvement, cultivating success and good practices as inspiration, and gathering all these around innovation.

These are the factors which determine, nowadays, productivity and value creation, besides the capital/work combo. These lines of reflection can help to give a context to what we've been doing, optimizing some inquiring and enhancing aspects in the evaluation of intellectual capital.

The collation between the obtained results and the four summoned dimensions conduct us to the following conclusion: if we consider as representative, in a primary analysis, the data relative to the identification of residual needs, we verify a tendency of the executive directors to focus in the processes and training clusters (example: "create a task manager tool easy-to-use", "encourage and motivate the staff towards a better productivity"). Secondarily, we find concerns with quality and innovation improvement (see table below):

Table 4: Data Distributed By Intellectual Capital Vectors

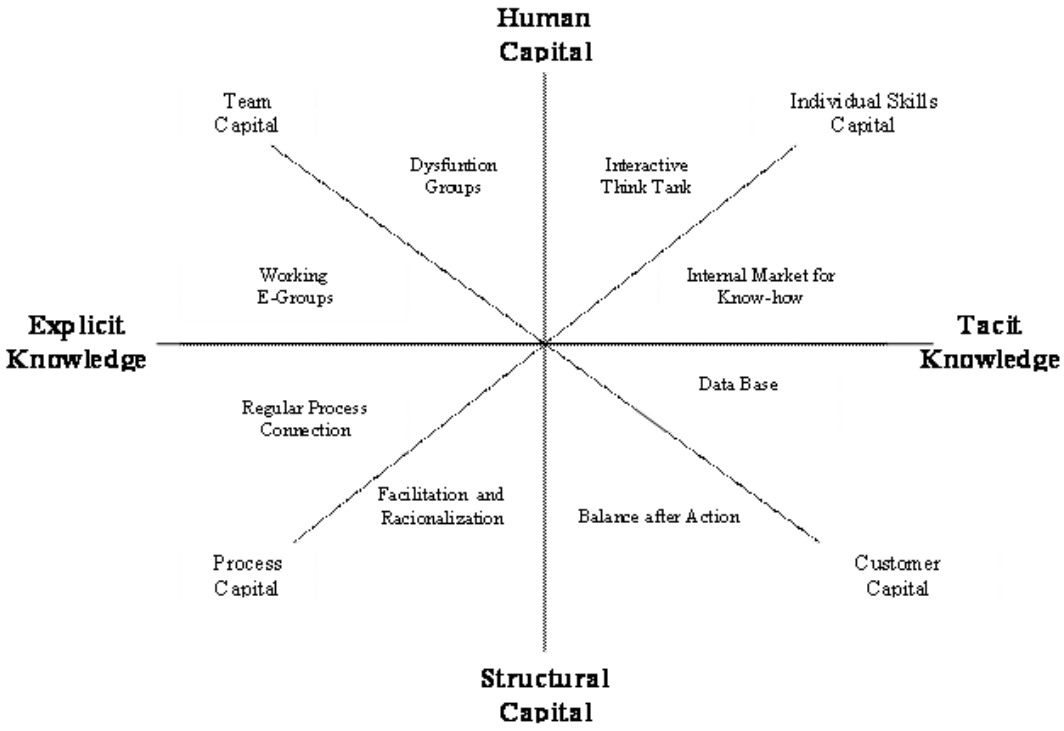
	CONCERNS	PERCENTAGE
Quality **noticed by market**	• **Improvement of the company's image**	**40,9%**
Concerns with Processes	• **Create a task manager tool easy-to-use**	**40,9%**
	• **Support in the conception/preparation of booklets**	**34,1%**
	• **Create a cost control system suitable to the task**	**31,8%**

Concern with Staff Training	• **Encourage and motivate staff towards a better productivity**	**38,6%**
	• **Promote the staff training in behavioural area**	**34,1%**
	• **Better Time Management**	**31,8%**
Investment in Development and Innovation	• **Find out the investments in development and innovation more suitable to the company**	**36,4%**

The focus on human capital is capital, likewise investing more in quality, for example, analysing the customers' complaints, examining thoroughly the market. Above all, by focusing in innovation, by creating research and development team forces for the product, such as for new markets segments, it is possible to generate a cluster of small and medium enterprises with the ability of being competitive and autonomous in face of the market, with satisfactory profitability levels.

A summation of this research was described by Martins (2008) through the following schema:

Figure 1: Martins' Intellectual Capital Model



Source: Martins, 2000; Martins and Lopes, 2008

It is important to point out that the reach and development of this model obviate further research.

7. Conclusion: The Intellectual Capital Perspective Focus On Value, Instead Of Cost

The raise of turbulence, the rising change and the need of knowledge have led to more complexity, both internal and externally to organizations. The focus on intellectual capital is a direct consequence of these new conditions. It's expected that intellectual capital concerns this raise of turbulence, need of knowledge and shifting necessities. The complexity concerns with the number and types of existing relations and elements in a system. Complexity is also connected with the composition, structure and function of the system (Rescher, 1998, p. 1).

According to this perspective, there is a degree of complexity in every system. In the case of a high degree of complexity, the behavioural system is easily considered as chaotic. That is, we're in the presence of a situation where the system performance, based in the way the different parts operate, is difficult to explain. Hence a raise of complexity is verified in a system, the subsequent expansion has the tendency to follow it (Rescher, 1998, p. 6) – for example, the complexity nourishes itself. The complexity represents the true problem, and it's the management of intellectual capital what can solve that problem.

This is one of the reasons whereby "to manage intellectual resources can be the most simple and important business task" (Stewart, 1997, p. XIII). Intellectual capital, according to Ulrich (1998, p. 15) is a critical factor within systems because of the following reasons:

- The search for functional knowledge in an expanding economic system is in is prime (human capital-related entities);
- The purpose and significance of work carried out adds importance (symbolic entities);
- The primary line became notoriously important in view of the customer's value (network-connected entities);
- The learning and innovation became clearly important in the new economy (structural entities)

The perspective of intellectual capital achieves the potential for the value creation of a resource or transformation as a starting point, despite its origin, complementing, therefore, the structure of accounting. While the previous model, based in the economic and financial structure of accounting, provides an excellent study question about the costs related to historical and future transactions, this

new organization allows looking for the value creation sources and to their path, identifying vectors possible convertible to financial results, in spite of that sources' origin.

The future of organizations relies on the attitude towards this new surrounding reality. In the long run, we make the path by walking, and this paradigm crisis forces us to rethink about management and the role of limited resources, for a long time, the centre of economic theory. This notion is clearly unadjusted to the present organizational reality, where the long term sustainability and the creation of intangible value vectors assume a premier role.

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Contact the Authors

Felipa Lopes dos Reis, Open University, Portugal: felipareis@net.sapo.pt

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