

Impact of Individual Knowledge on the Increase of Sustainable Intellectual Capital of Organizations - A Systemic Approach

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Abstract: How individual knowledge affects company knowledge and how this affects company performance has been considered from different points of view. We believe that system dynamics offers a richer approach for understanding this complex relationship than other methods because of its ability to incorporate soft variables into this type of analysis. This is especially true for companies whose main assets are intangible, such as business consulting. The paper contributes to the understanding of the interactions between two structures: individual learning and the development of intellectual capital within organizations, emphasizing how the first one leverages the second. The three sections of this paper include a brief introduction, the modeling process overview and how the structures interact.

INTRODUCTION

The technology age of the last few decades has brought a boom of tools and methodologies focused on using knowledge in a better way. Some of the consequences have been intranet webs, more sophisticated communications tools and information overload. In the new paradigm, companies need to share knowledge to be able to succeed. However, there is a danger of falling into a vicious spin of data overload, where people need to identify and learn to look for the relevant information. The search for relevant data can be a very expensive process. The main goal is to filter the data and store only the needed and useful information.

On the other hand, the importance of people has become increasingly important. Money talks, but it does not think; machines perform, often better than any human being can, but they do not invent. Thinking and invention, however, are the assets upon which knowledge work and knowledge companies depend (Stewart, 1997). There is no longer just a physical employee, there is a knowledge employee. The work is less mechanic and more thinking-oriented. Or as Quinn says: 'Ideas and intellect, not physical assets, build great companies' (Quinn, 1992).

We are living in a knowledge boom, where the common paradigm is that people are the most important asset for the company. As a result, efforts have been focused on hiring and retaining people with the best intellectual abilities to do the job, charismatic people that contribute with ideas to improve how business works. Nothing better exemplifies the revolutionary transformation from industrial age thinking to information age thinking than

the new management philosophy of how employees contribute to the organization (Kaplan and Norton, 1996). Knowledge industries, like consulting (often described as “knowledge businesses”) are increasingly appreciated in this age. In terms of Intellectual Capital (IC), we are describing Human Capital, the first of the three types of IC.

The common assumption is that getting people to learn is largely a matter of motivation. When people have the right attitude and commitment, learning automatically follows. So companies focus on creating new organizational structures - compensation programs, performance reviews, cooperate cultures, and the like - that are designed to create motivated and committed employees (Argyris, 1993). Therefore, the leadership must be based more on conceptual and interpersonal rather than technical competencies (Espejo, 1996). The way to incorporate new (individual) ideas into the organizational knowledge (or intellectual capital) must be free of any barriers (Mueller-Stewens, 1996).

MODELLING PROCESS OVERVIEW

The following diagrams show the individual learning process. It focuses on the relevant variables that generate learning. The Stock-Flow diagram focuses on what increases and decreases the individual level of knowledge.

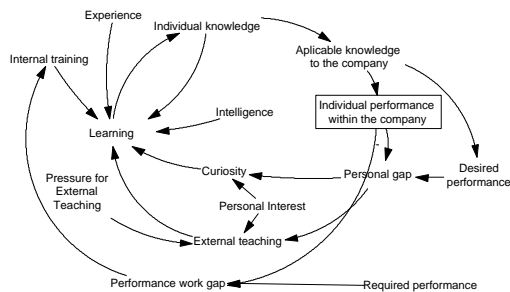


Figure 1. Individual Learning process. Causal diagram.

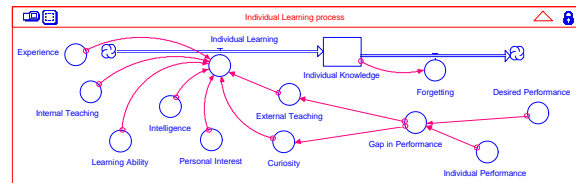


Figure 2. Individual Learning process. Stock-Flow diagram.

We assume that ‘old’ knowledge is not unlearned or forgotten but substituted by ‘new’ knowledge; this is a simplification to keep the Causal loop diagram and Stock-Flow diagram easier to understand.¹ Many companies have several Individual Knowledge processes with a large Intellectual Capital process fed by each one of them. So, why ignore individual knowledge? Why, if knowledge is used in the best way, are the results less than expected?

Imagine that you have 1,000 employees. You should have 1,000 Individual Knowledge links feeding Intellectual Capital. What would happen if you just used 100 employees’

¹ Another System-Dynamics-model on individual learning, including a discussion on forgetting and unlearning can be found in: König, U. *Ansätze zur Simulation des Wissenserwerbs mit System-Dynamics-Modellen*, in: Schwaninger, M. et al (Ed.) *Intelligente Organisationen - Überlebenskonzepte für turbulente Zeiten auf der Grundlage von Systemtheorie und Kybernetik*, Duncker&Humblot, not yet published.

knowledge? This happens in many companies around the world. What would happen if you use 900 employee knowledge? Would be there a difference? Figures 3 and 4 show the use and transmission of knowledge towards the company. The main question is how to make good use of or improve the use of knowledge. Stock-Flow diagram has two levels: individual knowledge and intellectual capital. Some of the relevant variables and their bases are explained in the following pages.

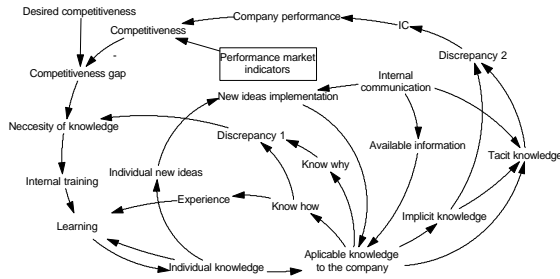


Figure 3. Intellectual Capital. Causal diagram.

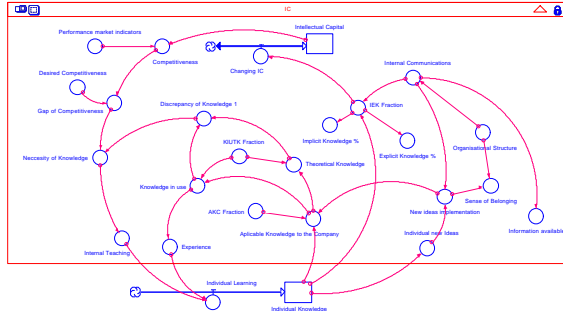


Figure 4. Intellectual Capital. Stock-Flow diagram.

Applicable knowledge to the company

We suggest that the perspective of knowledge should be organizational, not individual: The question companies should ask is how to acquire as much human capital as they can and use it profitably. Human capital grows in two ways: when the organization uses more of what people know; and when more people know more of what is useful to the organization (Stewart, 1997). This raises the importance of the applicability of individual knowledge to the company as one of the most important factors for translating individual knowledge to intellectual capital.

As shown above, applicable individual knowledge is a relevant variable strongly linking both diagrams. For example, if the professional satisfaction of your employees, comes from learning about cheese, you wont keep them if you offer only the chance to build a better mousetrap (Stewart, 1997). People working in a company have, to some extent, the same interests as the company. The way they can use the knowledge they have determines, in large part, their motivation.

Know how and Know why

Argyris and Schön proposed a theory of action perspective which assumes that human beings design their actions. Individuals hold two theories of action: their espoused theory - describing the way they say they behave - and the theory-in-use, which describes the behavior they actually display (Argyris, 1993). The importance of this difference is significant if we think about groups and organizations. Very often a gap exists between the team leader's "Theory of action" (Know why) and the team players' "Theory in Use" (Know how), between the way they think they are acting and the way they actually act. The bigger the inconsistency between these two, the worse the problems, especially if the team leader is not willing to accept new 'ways of action'.

Explicit and Tacit knowledge

Have you ever met a brilliant salesman, and when you asked him how he sells, he just does not know how to explain it to you? If this man could teach his sales technique more salesman would improve their salesmanship (assuming people with average sales skills). Why is this so difficult? Because it is hard for him to articulate this special knowledge with formal language.

“Explicit knowledge” can be articulated in formal language including mathematical expressions and manuals. This knowledge can be transmitted across individuals formally and easily. It has been the dominant mode of knowledge in the Western philosophical tradition. The Japanese company adds a second type of knowledge, “tacit knowledge”. This has an important cognitive dimension embedded in individual experience and involves intangible factors such as personal belief, perspective and the mental models (Nonaka, 1991). In the West, tacit knowledge has been overlooked as a critical component of collective human behavior. In contrast, tacit knowledge - and diffusion of learning from individual to team to organization is a critical source of Japanese companies' competitiveness. “Knowledge is created between the interaction of explicit and tacit knowledge,” says Nonaka.

To use more of what people know, companies need to create opportunities for private knowledge to be made explicit (Stewart, 1997). Stewart uses private knowledge instead of tacit knowledge. However, the idea of the need to translate tacit to explicit as a driver of knowledge use and creation is the same. The division between Know how and Know why and Tacit and Explicit knowledge means that, for us, tacit knowledge could be either know how or know why, as well as tacit or explicit.

Innovation and Sense of belonging

New knowledge always starts with the individual. Managers everywhere recognize the serendipitous quality of innovations. Making personal knowledge available to others is the central activity of the knowledge-creating company. It takes place continuously and at all levels of the organization (Nonaka, 1991).

Management thinker Charles Handy says: “I believe that corporations should be membership communities. In order to hold people inside the corporation, we can't really talk about their being employees anymore... There has to be some kind of continuity and some sense of belonging.” (Stewart, 1997). In the overall model, the variable “sense of belonging” is one of the main links between Intellectual Capital process and Individual Knowledge process. Though any of these diagrams could be much more detailed, it is enough for studying how one affects the second. Futures efforts will be focused on the macro level. The integrated causal and stock-flow diagram can be found in the Appendix.

GETTING INSIGHTS - HOW THE STRUCTURES INTERACT

SDSG applies a suite of tools and methodologies to mine information from the model. This model is not perfect nor without potential controversy. Few are. Experience shows that we can learn a great deal from imperfect models. The danger is in overlooking the weaknesses of the model. Applying SDSG's tools and methodologies (Ritchie-Dunham, 1997) the following insights were obtained:

Influence/exposure analysis

The variables with the most leverage are Internal communication, Learning, Applicable Knowledge to the Company and Individual Knowledge. The fact that Applicable Knowledge to the company is one of the variables with high leverage lead to focus on the way the company uses the knowledge and a few critical questions: What are the incentives to use "new" knowledge in the company? What are the opportunities for innovation? To bring in new knowledge in the traditional way most likely could not be implemented.

How to change the focus from a company learning abstract concepts to a group of individuals learning together? Our experience has told us how important communication is within any business and among numerous people. In the consulting industry, and in a virtual company, the importance rises significantly, becoming the driver to get all the people rolling the ball in the same direction and helping to spread underlying skills and experience.

Systemic view of the organization

The main blocks within a company from the Intellectual Capital perspective are: Human Capital, Structural Capital and Customer Capital. In this case, we assumed that Customer Capital is chiefly determined by Human and Structural Capital. Shared knowledge is the ultimate form of Customer Capital (Stewart, 1997). For example, the way in which we treat a client, the way the company orders raw materials, the policies to choose a supplier and the relationships with suppliers and clients, are results of the bulk of knowledge and how it flows within the company, of how the departments interact, of the objectives within each operating area and, the goals of the organizational and the structure that it rest upon. (Human Capital and Structural Capital). Along with these two main blocks, we include two more: Individual Learning process regarding how the person learns and the Strategic Management process regarding the impact of Intellectual Capital and some organizational aspects affecting it.

Figure 5 shows the relevant groups and the variables depending upon the decisions being made. The divisions between groups indicate permeable boundaries across which groups share "common resources."

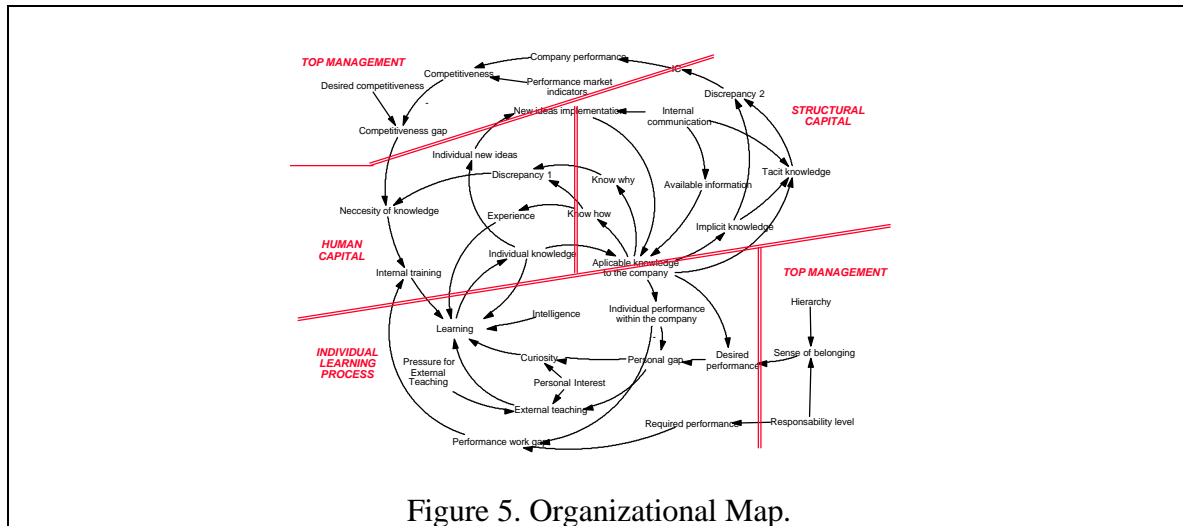


Figure 5. Organizational Map.

HUMAN CAPITAL - The main objective is to maximize Knowledge amount.

What they usually say: People would perform better if they have more training and more information about how the company works.

Who is usually in charge: Human Resources department, immediate level up, employee.

STRUCTURAL CAPITAL - The objective is to maximize communication within the company.

What they usually say: The most important factor to have a successful business is to have and excellent communication structure in order to get to the employee the information necessarily to do the job.

Who is usually in charge: Systems, immediate level up.

TOP MANAGEMENT - They focus efforts on maximize company performance and Intellectual Capital.

What they usually say: Everything is about improvement business performance. Have a company well structured should be enough.

Who is usually in charge: Top Management, partner level.

INDIVIDUAL LEARNING PROCESS - The goal is to maximize Individual Knowledge.

What they usually say: I have a lot of knowledge about many things, however, not all of my knowledge is applicable to the company.

New ideas? Those are not applied! It is not worth spending time and effort on that.

Who is usually in charge: Employee.

The fact that every part depends upon one or two actors, makes the work harder. If there is no participation from the top level, there will be no participation from the lowest levels. It is necessary to encourage employees' performance and structure the organization in order to facilitate the flow of ideas and implement them among and within departments. The immediate level up plays an important role in how to translate individual knowledge to Intellectual Capital. The responsibility of the translation has to be shared and

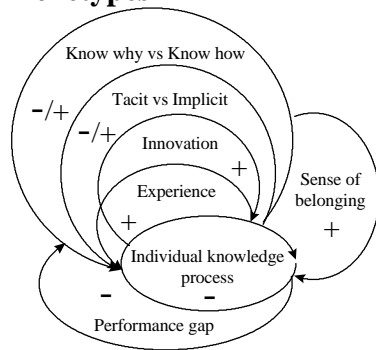
communicated. It is necessary to cross internal and external company boundaries to exchange information and create synergy.

Performance indicators

Poor individual performance and poor idea generation are not necessarily the employee's fault. The organization could have been structured in a specific way that lead to a certain behavior and result. One simple, and widely used, measure is the number of suggestions per employee. This measure captures the ongoing participation of employees in providing the organization's performance. Such a measure can be reinforced by a complementary measure, number of suggestions implemented, which tracks the quality of the suggestions being made, as well as communicating to the work force that its suggestions are valued and taken seriously (Kaplan and Norton, 1996).

Surveys could be used to determine the discrepancy between tacit and implicit knowledge, as well as between espoused theory and theory in use. Interesting indicators are percentage of systems implemented by year, percentage of employees using the systems, internal training expenses by year, percentage of turnover and sense of belonging.

Archetypes



This generic structure leads us to identify the “Principle of attractiveness” archetype conformed by multiple “Limits to growth”. There is more than one limit to growth and they could not be addressed equally.

Symptoms: “Why worry about problems we don’t have? We’re growing tremendously.” A little later, “Sure there are some problems, but all we have to do is go back to what was working before.” Still later, “The harder we run, the more we seem to stay in the same place.”

Figure 6. Archetype Structure. (Senge *et al.*, 1994).

Learning and implementing knowledge when people start working at the company, are fast. However, after a while, there are some limits to the natural abilities and to the bulk of implement knowledge to the organization main activity.

It is rather comfortable to maintain an average performance once we reach it, without setting ourselves a higher goal. Once the individual knowledge process reaches the required performance goal, the loops spinning up learning through training and experience are not enough to improve or change the way knowledge is used. The loops minimizing the discrepancy between tacit and implicit knowledge, between know how and know why, can help. However, it mostly depends upon the company structure and culture. The individual needs other kinds of motivation in order to improve performance and make the Innovation loop possible. Sense of belonging loop becomes important when the company wants to be more than a traditional company, a learning organization.

For the practitioner

In the great wave of ‘Organizational Learning’ and ‘Knowledge-Management,’ many organizations have tried to implement these concepts. Every month a book or article is published on these subjects. But one should not try to implement knowledge-management by just any means, it has to be done step by step and very carefully. Willke shows one way to build an organizational knowledge base (Figure 7). He says that there are differences between the organizational knowledge/knowledge management and the individual way. The organization itself is able to create and manage knowledge that is only valuable for itself and not the individuals in the organization. (Willke, 1995) Other ways to implement an useful knowledge management is the (already mentioned) concept of balanced scorecards by Kaplan and Norton (Kaplan and Norton, 1996) and, of course, Peter Senge’s five disciplines (Senge, 1990/1994). But one should realize that all these concepts are based on feedback. None could be considered without reflecting on the effects and the use of information (knowledge).

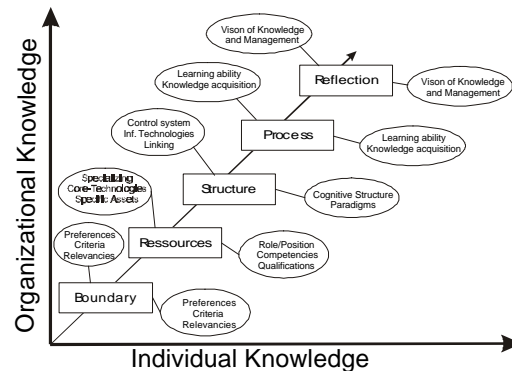


Figure 7. Steps to create an organizational knowledge base (Willke, 1995).

Some companies have very successful knowledge management, like McKinsey or SAP. Especially in global organizations, strong and functioning knowledge management is essential. This could only be handled by a very formal and technical storing of knowledge. These knowledge-data-bases can typically be accessed from every branch of the company. In small companies it is quite easy to share knowledge, but complexity increases as more people are part of the organization. To show the complexity of the communication process we can use this easy formula (Mansfield, 1961), where N is the number of elements (persons) and C is the number of possible combinations (in pairs). We can see in the formula below that the number of possible combination increases exponentially. There is a high potential of cost- and time -saving, if one is able to formalize this process.

$$\begin{aligned}
 C^2_N &= \binom{N}{2} \\
 &= \frac{N!}{2!(N-2)!} \\
 &= \frac{1}{2}(N^2 - N)
 \end{aligned}$$

APPENDIX

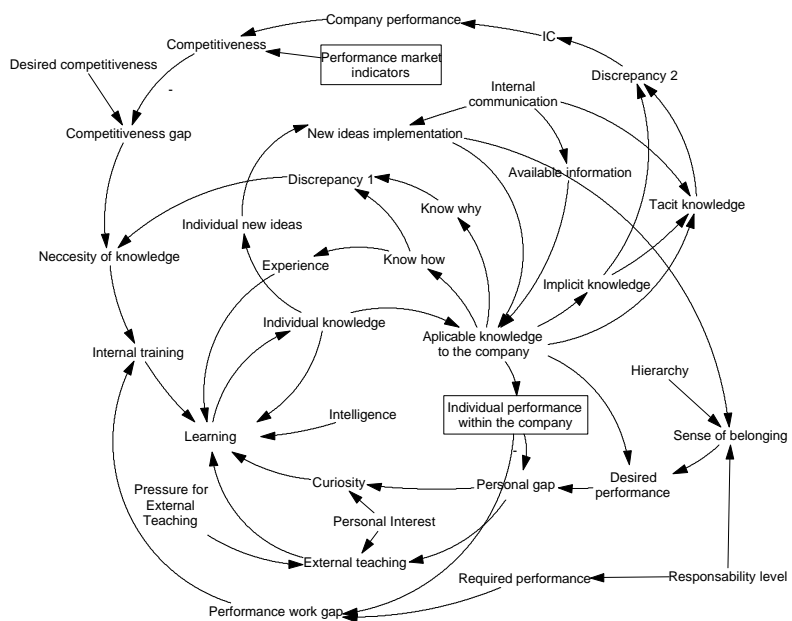


Figure 8. Causal diagram.

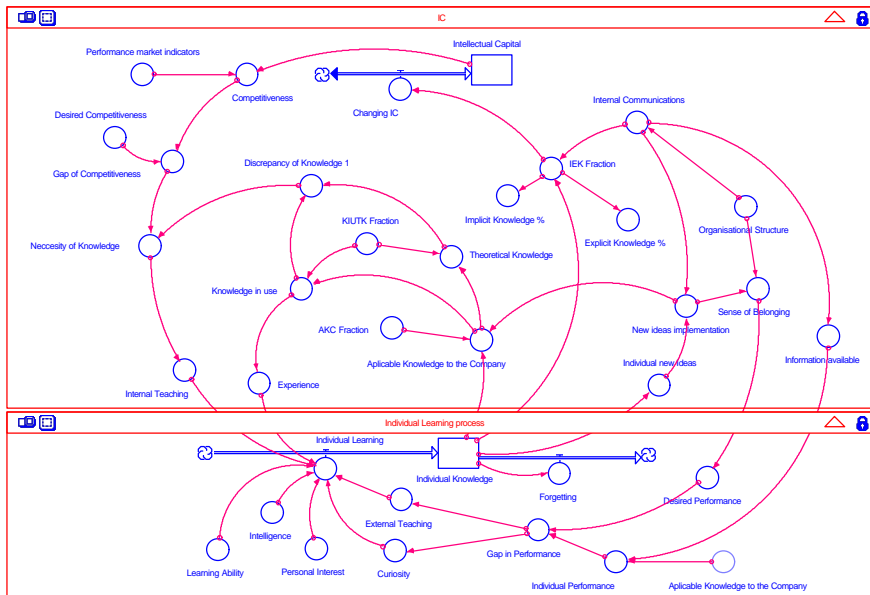


Figure 9. Stock/Flow diagram.

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