

# LEARNING ORGANIZATION

## *Concept and Proposal of a New Approach*

Artur Ferreira da Silva

*Instituto Superior Técnico, Universidade Técnica de Lisboa, Av. Rovisco Pais, Lisbon, Portugal*

Keywords: Complexity, Learning Organizations, Learning Architecture, Patterns, Reflective Research.

Abstract: This paper presents a research project in progress aiming at accelerating and making more profound the learning in organizations. The concepts of learning organization is revised and a learning architecture based on Alexander's patterns is proposed. Some aspects of the context and methodology used are also mentioned.

## 1 INTRODUCTION

This paper describes an action research project in progress for some years, the objective of which is to make a contribution to the identification of patterns of a Learning Architecture, that attempts to transform organizations with severe learning disabilities into organizations more able to learn.

In Section 2 we conduct a revision of the concepts of Learning Organization (LO) and Learning Company, based on the works of their two major proponents, Peter Senge and Arie de Geus. As we will see, de Geus often mentions that learning companies can be considered *alive*.

In Section 3 we will present the context that lead us to understand the need for a Learning Architecture, that is based on the concept of "patterns" developed by Christopher Alexander, which allows for the design of regions, towns and buildings that he considers *alive*.

In Section 4 a brief Outline of the Project is made, preceding the Conclusions.

## 2 TWO PERSPECTIVES ON LO'S

In the following sections we will summarize and comment on two conceptions of LO's, the first from Senge, and the second, from Arie de Geus, who uses mostly the equivalent expression "Learning Company".

### 2.1 Senge's Learning Organizations

Peter Senge was the main disseminator of the

concept of LO (Senge, 1992) (Senge et al., 1994), and his conception is the best known in the academic and business worlds and the most quoted in the literature on the subject. Everyone knows the five disciplines that Senge proposed to create a LO: Personal Mastery, Mental Models, Building Shared Vision, Team Learning and Systems Thinking. For some people, one organization is considered to be (or not) a LO, if it respects (or not) Senge's five disciplines...

Nevertheless, it must be said that Senge (1992) never claimed that his "five disciplines" have been "proved" by any academic research.

In "The Fifth Discipline" (Senge, 1992: 5-6) these disciplines are introduced with a mechanics analogy: "Engineers say that a new idea has been 'invented' when it has proved to work in the laboratory. The idea becomes an 'innovation' **only when it can be replicated reliably on a meaningful scale at practical costs**". And he continues explaining the five "component technologies" that are needed to come together to make airplanes for commercial use. "The DC-3, for the first time, brought five critical component technologies that formed a successful ensemble (...) **Today, I believe, five new 'component technologies' are gradually converging to innovate learning organizations**" - his five disciplines (all highlights in bold are from the author of this paper, except when specified).

The discussion of LO's is part of a greater field of Organizational Learning. Due to space constrains, this general question will not be directly addressed in this paper, except in two minor points, one of which follows (Tsang, 1997).

Tsang discusses the dichotomy between descriptive and prescriptive research in this field. He clarifies (Tsang, 1997: 85, Table II) that descriptive research tries to answer the question of "how does an organization learn?" and it is part of the "organizational learning rigorous research". It has the "objective of theory building" and its "target audience are academics". Prescriptive research is the one that refers to the "learning organization" and tries to answer the question of "how should an organization learn?". Its "objective is to improve organizational performance" and is normally based on the "consulting experience" of their authors. According to Tsang, Senge's position has to be considered as a prescriptive theory.

Indeed, as many others, in the decade that followed, Senge provided much training and consulting services to companies to help them to become learning organizations.

When "The Dance of Change" was published (Senge et al., 1999), Senge was interviewed by the Fast Company Magazine (Senge, 1999) and was introduced by these words: "Ten years ago Peter Senge introduced the idea of the 'learning organization'. Now he says that **we need to stop thinking like mechanics and - start acting like gardeners**". When questioned about the performance of the large scale change efforts in the past decade, he answered "My own experience at MIT and at SoL [Society for Organizational Learning] has mostly been with big companies. How much change have they actually accomplished? If I stand back a considerable distance (...) I have to conclude that **inertia is winning by a large margin**. (...) I have to say that there is enough evidence of success to say **it is possible** - and enough evidence of failure to say **it is not likely**." (Senge, 1999).

## 2.2 Learning Companies by de Geus

The need for companies to learn had been presented previously by Arie de Geus, at the time Head of Planning of the Royal Dutch/Shell Group, in a seminal article published in the Harvard Business Review (HBR), in 1988 (de Geus, 1988). In this article he presented briefly a study done by Shell that "surveyed about 30 companies that have been in business for more than 75 years". Even if "a full one third of the Fortune '500' industrials listed in 1970 had vanished by 1983" the survey identified "several (companies) that were still vigorous at 200, 300 and even 700 years of age and studied 30 (of those) companies" (de Geus, 1988: 70).

Arie de Geus also reminded us that learning within organizations is not mainly a question of some people learning, but of "institutional learning", which he defines as "the process whereby **management teams change their shared mental models** of their company, their markets and their competitors. For this reason we think of planning as learning and of corporate planning as institutional learning." (de Geus, 1988: 70).

He also recognizes that "**every living person - and system - is continuously engaged in learning**". In fact the normal decision process in corporations is a learning process, because people change their own mental models and build up a joint model as they talk. The problem is that the speed of that process is slow - too slow for a world in which the capacity to learn faster than competitors may be the only sustainable competitive advantage. (...) The critical question becomes: Can we accelerate institutional learning?" (de Geus, 1988: 71).

But de Geus' master piece is his book "The Living Company" (de Geus, 1997) where he presents in detail the Shell study already mentioned, and many other personal references and reflective learning of a lifelong professional career. It must be said that Arie de Geus has always been a "practitioner". The Shell group is a Dutch-English Group, with many interesting characteristics, namely "an ethic of distributed power" (de Geus, 1997: 223-227).

In the early 1980s, the Planning Group made a study of companies that were older and bigger than Shell - at the time 75 years old (de Geus, 1997: 10). Arie de Geus visited many Universities and later Shell "commissioned a study, conducted by two Shell planners **and two outside business school professors**, to examine the question of corporate longevity. From the very first moment we were startled by the very small number of companies which met (...) (the) criteria of being larger and older than Shell. In the end we found only 40 corporations of which we studied 27 in detail, relying in published case studies and published reports." (de Geus, 1997: 12).

The importance of studying those longlived companies was that they had been able to survive, with the same corporate identity and cope with various serious changes in the environment and had been able to change themselves to adapt to those external changes. So, they had proved that they were able to learn profoundly and systematically. During the study they identified that those longlived companies had "four key factors in common". They were (de Geus, 1997: 12-16):

- "sensitive to their environment" (or 'open')
- "cohesive, with a strong sense of identity" (having a 'persona' or the 'ability to build a community')
- "tolerant" (also referred as 'decentralized' or as having 'awareness to ecology')
- "conservative in finance" (having 'the ability to govern its own growth and evolution effectively').

The book has many suggestions (but they are neither recipes, nor prescriptions) for companies to accelerate and make their learning processes more profound, and it is a possible source of 'patterns' (our word) that may, eventually, lead to a more generative learning of organizations. It also mentions 'problems' - more common, by the way, in most organizations - that have exactly the opposite effect of the mentioned patterns.

Tsang (1997) would classify this book as a "descriptive theory", even if de Geus mentions modestly that the Shell Study has been conducted in an "unscientific way" (de Geus, 1997: 16).

Having concluded that companies can learn, de Geus refers to them as "living companies" or "living systems" because "only living systems can learn". Nevertheless, he also says that "It probably doesn't matter whether a company is actually alive in a strict biological sense or whether the 'living company' is simply a useful metaphor." (de Geus, 1997: 17).

In a chapter called "The problems with conventional learning", he writes (italics are from de Geus): "If decision making is learning, then *all companies learn all the time*. There is no need to 'build' a learning organization. You already have a learning organization. But the traditional time-honoured ways in which most companies accomplish this learning is inadequate" (de Geus, 1997: 77). And then he presents some of those disadvantages: "*It is slow*"; "*it closes down options*"; "*it depends on learning by experience and not on learning by simulation*"; and "*It breeds fear*" (de Geus, 1997: 77-80).

We end this section with a final quotation from the first lines of the almost completely unknown "Foreword" by Peter Senge to de Geus' book: "**It was through Arie de Geus, whom I met over 15 years ago**, that I first became seriously acquainted with the concepts of organizational learning. That meeting began the journey of a lifetime" (de Geus, 1997: 1).

It is a pity that these words are not also in the beginning of "The Fifth Discipline". This would have avoided much confusion in the business and academic fields. Indeed, de Geus is so little known

that he is not normally quoted in relation with these concepts and he was not included in the references of the Tsang's paper mentioned.

## 2.3 Reflective research: How Professionals Create New knowledge

Many readers may feel distressed with the preceding pages: So, there are some academics that can conduct "prescriptive research" and produce guru-like books and some practitioners that can produce "descriptive research", that is both relevant and rigorous? Are there not Universities that produce the knowledge that the professionals apply? Does this mean that, at least in some cases, it may be the exact opposite that happens?

Those questions are very similar to the ones that led Donald Schön to write "The Reflective Practitioner" (Schön, 1983). In this book, he makes a strong criticism of the Technical Rationality, dominant in our society and universities and how the "Reflection-in-Action" may be an alternative. (Schön, 1983: 21-69). He shows how professionals think-in-action and how many reflect on past actions, producing new knowledge, and apply these concepts to many different professions (Schön, 1983: 76-204). He also proposes, as a variant of action research, a method of "reflective research", that can be used by professionals and researchers alike, and often in combination, allowing for the production of results that are both rigorous and relevant (Schön, 1983: 307-325).

## 3 A LEARNING ARCHITECTURE

### 3.1 From Information Systems to the need of a Learning Architecture

By the early 1980's, our previous professional experience had convinced us that all Information Systems (IS) developed within organizations are always **socio-technical complex systems**, and the "requirements" result from the "emergence of sense" between developers, management teams and other professionals involved. Hence, "requirements" do not pre-exist to the "design" - they are laboriously constructed and/or emerge during the process, in a permanent dialogue with the materials and with all the people involved. Also, when an application is developed within an organization or a change project occurs one must understand that every organization

is a complex socio-technical system by itself. Thus when we touch even what may seem to be a small part of it, we are always touching the whole system.

To understand an organization is to understand this complex system, and to change an organization of a reasonable dimension is to cope with all this complexity, including the further complexity that results from the fact that new forms may emerge at any moment from within the pre-existent complexity. To talk about "implementing change", "managing change" or "creating a learning organization", without taking into account the aforementioned complexity is a sure recipe for disaster - unless some good things emerge **in spite of** the efforts of the changing team...

When the de Geus' HBR article was published, we were involved as consultants to the Board of the Bank of Portugal, where we were working directly with a small, high-level team of directors and senior professionals in charge of creating a new global, company-wide, "Information Model" or "Information Architecture" for the Bank - in consultation with the Board, all Directors and many senior professionals of all Departments.

Two years earlier, a well known multinational consultancy company had developed an Information Systems Plan for the Bank. They had interviewed people from each Department separately and proposed a Portfolio with a long list of departmental applications, each one with its own data base, that had been later developed with different definitions and different times and rules of actualization - all of this using the same Relational Database System (DB2) that they had also proposed. By the time we were called in, the Board was **unable to understand anything** of what was happening in the Company (and the Country) because each time they met to discuss any given subject two or three Directors would arrive with different information - all in the zebra-like green-white paper obtained in the same central mainframe, but from different applications and data bases.

The Information Architecture team identified and defined 242 'macro-processes' and 435 'Information Types' (or data entities) that should be used consistently in the future within the whole company and in all their computer applications. Of course the old IS Plan was now obsolete and a new one had to be created, which was commissioned to the same team, and was initiated some weeks later. During the time between the two projects, and using a participatory "reflective practice" approach, the whole team reflected on the process so far, with special emphasis on the socio-organizational

conditions involved, and published a paper in a professional Conference (Rodrigues et al., 1990). In that paper one of the main conclusions was that although the new "Information Model" was extremely important, **the more important result was the institutional learning** reached by the Board, all the Department Heads and senior professionals that Information was a strategic resource of the company that should be managed in a holistic way.

### 3.2 Learning Architecture's Patterns

Indeed the main problem of companies is learning and organizations need to have a "Learning Architecture" as they have other Enterprise Architectures (the Information one being a good example). If it is true that all companies learn it is also true that the majority of them suffer from "severe learning disabilities" especially in what concerns "double loop learning" (Argyris and Schön, 1996), this being the main reason why they are often unable to learn, change and adapt to the changes in the environment quickly enough, and die prematurely.

We must clarify now what we mean by a Learning Architecture and how it applies to our project. In normal life the word "Architecture" applies, at least, to two different situations. We talk of Architecture when we are talking about designing a bridge, a building or a park, for instance. But we also talk about Architecture when thinking about planning (or re-planning) a town. This Section will be based mainly on the works of Christopher Alexander (1979, 1964), (Alexander et al., 1977).

The first book (Alexander, 1964) is principally about design and its main interest is to create a good introduction to the other two, especially when Alexander writes: "If we agree to treat fit as the absence of misfits, and to use a list of those potential misfits which are most likely to occur as our criterion for fit, our theory will at least have the same nature as our intuitive conviction that there is a problem to be solved." (Alexander, 1964, 26-27).

But in what concerns our purpose, it is "The Timeless Way of Building" (Alexander, 1979) that is most important. "There is a central quality which is the root criterion for life and spirit in a man, a town, a building, or a wilderness. (...) In order to define this quality in buildings and in towns, we must begin by understanding that every place is given its character by certain patterns of events that keep on happening there. (...) These patterns of events are always interlocked with certain geometric

patterns in the space. (...) The specific patterns out of which a building or a town is made may be alive or dead. To the extent they are alive, they let our inner forces loose, and set us free; but when they are dead, they keep us locked in inner conflict." (Alexander, 1979: ix-x). Even without going further into the whole book, this quotation is enough to remark upon the following points.

The first remark relates to the understanding of the importance of the physical spaces of organizations, and Nonaka's concept of physical "Ba" (Nonaka and Konno, 1998), (Von Krogh et al., 2000) that we have already applied in other work (Silva and Tribolet, 2007). But the most important remark is that this does not apply only to buildings or towns, but also to men and their organizations that, as de Geus also commented, can be *alive* or not, giving an important hint to what can be a "living organization", that is, by definition, a learning one.

Even if published before, "A Pattern Language" (Alexander et al., 1977) is the second of these two books and presents 252 patterns from the whole to the particular (regions, towns, buildings) and from the design to the construction. Each pattern has a title, a description of the problem (unfit) to be solved followed by the proposed pattern.

In what concerns Learning Architectures, like in Alexander's patterns, we must create patterns of an Architecture that facilitates, more than creates, the desired changes and learning - and then hope that a senior executive will not destroy everything with his best intentions. Some would say that, after preparing the terrain, planting the seeds, watering when needed, and doing all the other things that are under his control, the only thing that a farmer can do is to pray... Indeed we are saying that one cannot create a LO, one can only design a system that allows for learning and nurture it, much in the same sense of what is done in agriculture.

The development in recent years of complex systems research and its application to society and organizations (Davis and Sumara, 2006; Rosenhead, 1998) deserves some comments. On one hand, organizations are an instance of complex systems that can go from one learner or a small group, to a company or a local or regional community, and even to the whole of Humanity. Probably many of the learning patterns that apply to organizations can also apply to civilizations and vice-versa. This allows, for instance, to search for patterns in other phenomena, like the 'birth stage' of the movements that created our most important civilization transformations (Alberoni, 1989).

On the other hand it is impossible to think about Organizational Learning and LO's from only one academic domain. Not only LO's relate with learning (and unlearning) in all the afore mentioned dimensions, but they also relate to the findings in many disciplines, namely, but not exclusively, in "organization theory" (Rosenhead, 1998), as well as sociology, anthropology, ecology, etc. So a cross-disciplinary perspective is needed. But even if this has been suggested by many Authors since the 1960's (Piaget, 1967), (Morin, 1986), (Le Moigne, 1995) the restricted domain-centred view of academic research has made inter or cross-disciplinary work more a dream than a reality. Even today, where complexity theories are being considered in many domains, they continue to be generally treated in each one, separated from the complexity studies of the others. Rosenhead (1998) commented that "Indeed there is no unified field of complexity theory, but rather a number of different fields with intriguing points of resemblance, overlap or complementarity. While some authors refer to the field as 'the science of complexity', others more modestly and appropriately use the phrase in the plural".

So what is most needed is to **change the paradigm with which we understand organizations**, and stop doing only "normal science" (or "puzzle resolution") when, clearly, what is needed is a profound "paradigm shift" (Kuhn, 1970) and if that is true, then, more than many citations of recent papers of only one restricted domain, it is important to refer to critical references of many domains of knowledge, where the date of publication is less important than the correctness of the ideas.

#### 4 OUTLINE OF THE PROJECT

As it has been mentioned above, this project began as a reflective research project, when the author was a professional Systems Engineer, and it is based on many cases and on a constructivist epistemology. The project continued later in academia where other research experiments on learning have been conducted. Some of those experiments were about teaching and learning; others have been conducted within organizations, trying to improve their knowledge management and learning; still others were related with "students organizations" that, due to the fact that their "management teams" have a short period of service, can be very important to study learning, change and emergence in

organizations, as the vinegar fly is in genetic mutation studies, due to the fact that they live very short lives. It is the result of all those reflections, (conceptual) readings and "reflective research" experiments, that this paper introduces.

## 5 CONCLUSIONS

In this paper we have presented synthetically a research project intended to accelerate and make more profound the learning processes of organizations, through the concept of a learning architecture, based on Alexander's patterns. We have made a revision of the literature and presented the context and methodology of the project and some sources for the mentioned patterns.

## REFERENCES

- Alberoni, F. 1989. *Genesi*, Garzanti Editore.
- Alexander, C. 1964. *Notes on the Synthesis of Form*, Cambridge, Massachusetts and London, England, Harvard University Press.
- Alexander, C. 1979. *The Timeless Way of Building*, New York, Oxford University Press.
- Alexander, C., Ishikawa, S. & Silverstein, M. 1977. *A Pattern Language - Towns, Buildings, Construction*, New York, Oxford University Press.
- Argyris, C. & Schön, D. A. 1996. *Organizational Learning II Theory, Method and Practice*, Addison-Wesley.
- Davis, B. & Sumara, D. 2006. *Complexity and Education - Inquiries into Learning, Teaching and Research*, New York, Routledge.
- De Geus, A. 1988. Planning as Learning. *Harvard Business Review*, 70-74.
- De Geus, A. 1997. *The Living Company : Growth, Learning and Longevity in Business*, London, Nicholas Brealey.
- Kuhn, T. 1970. *The Structure of Scientific Revolutions*, Chicago, The University of Chicago Press.
- Le Moigne, J.-L. 1995. *Le Constructivisme, Tome 2 - Des épistémologies*, Paris, ESF Éditeurs.
- Morin, E. 1986. *La Méthode - 3. La connaissance de la connaissance*, Paris, Ed. du Seuil.
- Nonaka, I. & Konno, N. 1998. The Concept of "Ba": Building Foundation for Knowledge Creation. *California Management Review*, 40, 40-55.
- Piaget, J. 1967. *Logique de la Connaissance Scientifique*, Paris, Éditions Gallimard.
- Rodrigues, A. J., Silva, A. F. & Teles, A. T. 1990. A Gestão da Informação nas Organizações - a Experiência do Banco de Portugal. *6º Congresso Português de Informática* Lisbon: Associação Portuguesa de Informática.
- Rosenhead, J. 1998. Complexity Theory and Management Practice. *The Human Nature Daily Review* [Online]. Available: <http://human-nature.com/science-as-culture/rosenhead.html> [Accessed 21-06-2011].
- Schön, D. A. 1983. *The Reflective Practitioner, How Professionals Think in Action*, Ashgate.
- Senge, P. 1992. *The Fifth Discipline: The Art and Practice of the Learning Organization*, London, Century Business.
- Senge, P. 1999. Learning for a Change - Interview by Alan Webber. *Fast Company.com* [Online]. Available: <http://www.fastcompany.com/magazine/24/senge.html> [Accessed 19-06-2011].
- Senge, P., Kleiner, A., Roberts, C., Ross, R., Roth, G. & Smith, B. 1999. *The Dance of Change - The Challenges of Sustaining Momentum in Learning Organizations*, London, Nicholas Brealey Publishing.
- Senge, P. M., Kleiner, A., Roberts, C., Ross, R. & Smith, B. 1994. *The Fifth discipline fieldbook : strategies and tools for building a learning organization*, New York, Currency, Doubleday.
- Silva, A. F. & Tribolet, J. M. 2007. Developing Soft Skills in Engineering Studies - the Experience of Students' Personal Portfolio. *International Conference on Engineering and Education*. Coimbra.
- Tsang, E. W. K. 1997. Organizational Learning and the Learning Organization: A Dichotomy Between Descriptive and Prescriptive Research. *Human Relation*, 50, 73-89.
- Von Krogh, G., Ichijo, K. & Nonaka, I. 2000. *Enabling Knowledge Creation : How to Unlock the Mystery of Tacit Knowledge and Release the Power of Innovation*, Oxford, New York, Oxford University Press.