Leading evolution by decreasing defensive behaviour

Malhéné Nicolas[1], Breuil Dominique[1], Bruno Vallespir[2]

[1]EIGSI : School of Industrial System Engineering

26, rue de Vaux-de-Foletier

17041 La Rochelle Cedex 1

E-mail : malhene@eigsi.fr

[2]Laboratoire d'Automatique et de Productique

Université Bordeaux 1

351 cours de la Libération

33400 Talence

1. Introduction

Productivity and quality were 80's key success factors : today, they can not guaranty enterprise's permanence. Competitive enterprises are the ones which evolve with their environment. Different factors explain this need to evolve : age of infrastructures, pressure of the competition, impact of the development of the data-processing and telecommunications, market globalisation, employee cultural evolution, etc. The combination of these internal and external factors forces an enterprise, competitive at the instant t, to evolve and to change in order to remain competitive at the instant $t+1$. Whatever the rank of an enterprise, it is not definitive.

Enterprise evolution, and enterprise transformation in a general way, retain all the attention of managers [1]. Depending on the way to manage changes, the evolution trajectory of an enterprise can be perceived through :

- a succession of steps : each step fathers a more or less radical change of enterprise's structure or of enterprise's functioning ;
- a continuous process ; the term « continuous » implies that landings generated by the evolution process are imperceptible for the external observant. The continuous evolution process supposes that internal actors / users do not present a defensive behaviour against proposed changes and so, they are able to integrate the impact of these changes.

The objective of this paper is to present basic principles of an approach fathering a continuous evolution. This approach is based on the concept of learning organisation which contributes in decreasing the impact of changes by taking into account the human factor of an enterprise.

The paper is decomposed into two main parts :

- the first part stresses the basic requirement in order to initiate the evolution process, mainly the target definition and the knowledge importation,
- the second part exposes in one hand the way to spread this new knowledge inside the organisation in order to improve its collective action and, in the other hand, the way to improve traditional approaches in order to achieve this objective,

2. Basic requirements of evolution process

Need to define a target

Organisation does not learn. People can. Numerous proposals exist in order to characterise the organisational learning. It is possible to synthesise those proposals and to define the organisational learning as the capability, for the organisation, to increase, in a continuous way, the efficiency of its collective action. Through a collective learning action, organisation develops a kind of organisational memory and a kind of organisational culture which allow to generate the learning capability of the

organisation. The question that remains is : how is it possible to initiate this collective learning action in order to built learning organisation ?

[2] defines the actor of a system as a person whose capacities and situation allow to control her uncertainties and who powers her way past the others. Any actor is able to build his own representation of the actual system and his own vision of the system evolution. Thus, each employee estimates that he gets the right actual model and the right future model of the system because both are coherent with his knowledge and consequently, correspond to his personal culture. If managers want to dictate their own representations and goals, they would stimulate a defensive behaviour due to the fact that these particular models are not, a priory, coherent with employees, knowledge and culture.

However, the evolution process should be initiated by the elaboration of a future system vision. But this vision must correspond to a common and shared model of the evolution process objectives. It has to be understood by all the employees and should group together their waits and their requirements. If the elaboration of the common vision can not be achieved and that some questions remain in minds of evolution actors, their contribution to evolution process implementation would decrease when this participation is essential for its success.

The long term vision should be associated to detailed models all along the evolution process. These detailed models allow to decrease uncertainty and contribute in improving the actors' motivation.

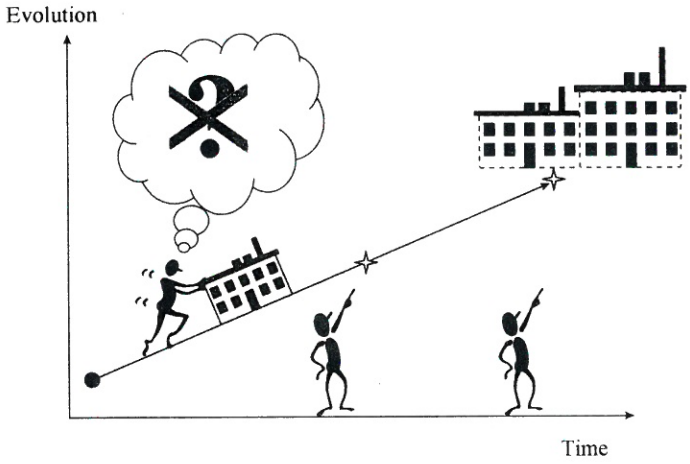

Figure 1: Employees participation

Need to import new knowledge

[3] presents a system as a combination of basic processors with one input and one output (cf. Figure 2). The variety of the system is a function of the number of processors combination. It represents the capability of the system to evolve. Considering a system with N processors, the variety is equal to :

$$V = 2^{N^2}$$

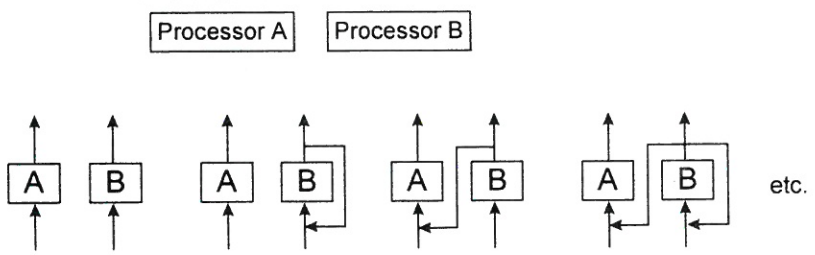

Figure 2: Combination of processors

A closed system can not import or exchange processors : its variety growths till a maximum V_{max} corresponding to the stoppage of the evolution process. This is not the case for an open system : the variety of the system continues to grow while the system is able to import new processors.

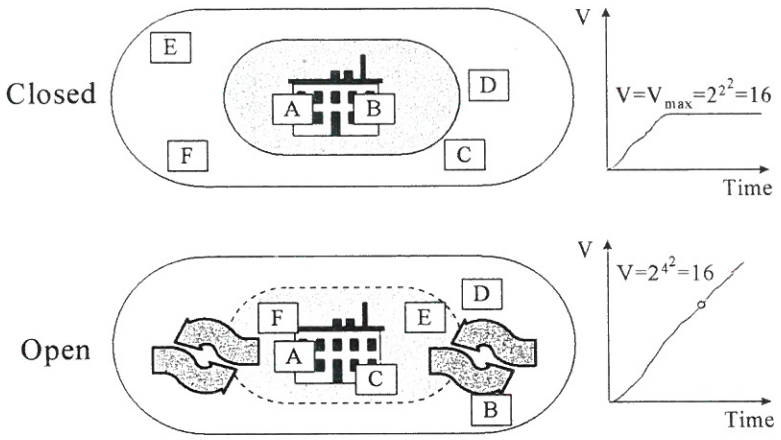

Figure 3: Closed system variety and open system variety

The enterprise is a complex system which is composed at least of two sub systems : the decisional system S_D and the physical system S_P. Each of these two system has its own variety. The finality of the first one is to control the second one. According [4], this means that the variety V_D of S_D must be superior to the variety V_P of S_P.

The definition of a clear target is not a sufficient condition to ensure the appropriation of the future system by the users. This appropriation supposes also that the actors are able to control this system. Consequently, it is necessary that the actors develop or create new knowledge that will allow them to understand and to control the future system. This means that both systems S_D and S_P should evolve in parallel in order to generate stable system in terms of control [5].

In fact the evolution process requires an important effort of integration. Most often, managers forget this effort and focus on objectives to achieve. They don't take into account the trajectory of the process and its intermediate states which require to import processors in S_D. This « partial » evolution is conducive to importation of processors in S_P without any integration.

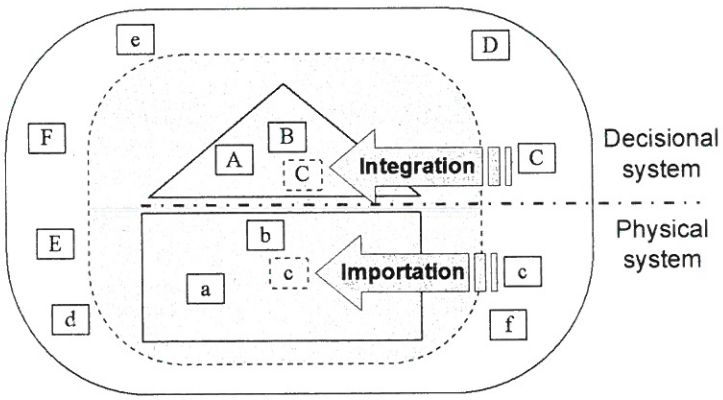

Figure 4: Importation and integration

The decisional system can not control the physical system. Consequently, actors of the evolution do not accept change and the efficiency of the collective action can not be improved.

3. Spreading new knowledge inside the organisation

Knowledge creation

The two previous paragraphs identify basic requirements in order to initiate and to ensure organisational learning and thus, to improve the collective action efficiency in the frame of the evolution process. But collective action includes individual action and its improvement underlies the fact that the individual action efficiency is also increased : in fact, there is no organisational learning without individual learning, but the process is far more complex.

The theory related to knowledge creation developed by [6] considers that the first function of the enterprise is to create a competitive advantage based on the collective knowledge and that the role of managers is to steer activities of knowledge creation. The authors introduce a knowledge creation spiral which describes organisational learning as a dynamic social process decomposed into four different modes :

- socialisation - from tacit to tacit - is a process which allows actors to share tacit knowledge,
- statement - from tacit to explicit - is a process during which tacit knowledge becomes explicit knowledge through the elaboration of concepts, assumptions, models, etc.,
- combination - from explicit to explicit - is a process during which actor creates new knowledge by combining new explicit knowledge with existing one,
- internalisation - from explicit to tacit - is the process allowing actor to learn by practising and to transform their explicit knowledge into tacit knowledge.

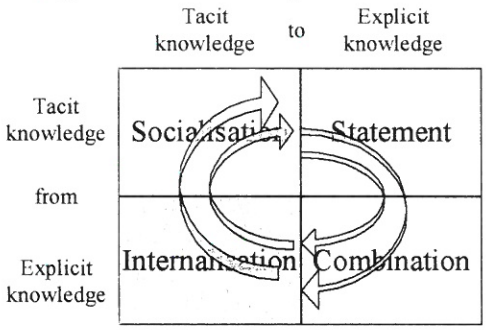

Figure 5: Knowledge spiral [6]

One dimension should be added to this model in order to represent the link between individual learning and organisational learning. [7] proposes the OADI-SMM model (Observes - Assess - Design - Implement with Shared Mental Models). Extension of the work done by [8], the model considers groups as sums of persons who have their own mental models and contribute, by sharing them, to the organisational learning. Insisting on the distinction between tacit mental model and explicit mental model, Kim stresses the importance of the socialisation phase.

[9] proposes a second model which consists in a systemic model integrating a regulation loop and which is decomposed into 4 main steps corresponding to 4 processes. *Integration* covers all the group work through which new knowledge emerges. *Integration* is the process in the frame of which the new knowledge is tested and modelled. The regulation loop is composed of the *capitalisation* of the knowledge and its *transmission*. This last step is quite similar to the socialisation phase identified by Nonaka.

Whatever the term they are using, socialisation, transmission, all these models stress the importance of a step which focuses on tacit knowledge exchange. Through this step, actors should render by themselves evolution opportunities and interest. Nevertheless, traditional analysis / design approaches do not include this socialisation step. For this reason, their implementation is badly received by employees. This kind of approach leads generally to a change that [10] names type 1. It affects mainly the structure of the enterprise because it stimulates a defensive behaviour. When actors understand the effect of the change on their routines, they reduce drastically their openness to evolution process. In consequence, the success of the evolution process is compromised considering the effort that managers have to do in order increase the motivation level and the openness to next change.

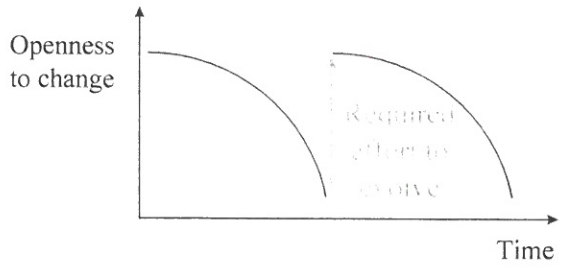

Figure 6: First type of change

Training introduction

According to our own experiences, the socialisation phase must be introduced in analysis / design approaches through training actions. The objective is to decrease or to avoid defensive behaviour stimulation. For that, actor should understand clearly what are the goals of the change and in particular what are the potential gains of this change : the gains for the enterprise and the gains for the actor. Any employee is not really interested by a technical description of the tool he has to use. He just wants to understand **why he has to use it**.

Training should allow participant to discover new ideas. They should have the liberty to transform these ideas into concepts by themselves in order to reinforce the feeling of self-learning but also the opportunity to implement these concepts in order to develop new knowledge. This principle was developed in particular in the frame of the European Project LEONARDO LOGTRAIN. Focusing on Supply Chain Management (SCM) area, the project aimed at experimenting Web Based Training through the development of a training program and a simulation tool both dedicated to SCM.

The global course is elaborated by a specialist of SCM. It presents basic principles of SCM and the objective of the approach. The trainee who accesses the course discovers the interests for his company and for himself. He has the opportunity to evaluate the impact of the implementation of the approach : this corresponds to the objective of the second phase. This phase consists in exploiting the simulation tool through a set of exercises proposes by a teletutor and which should conduce the student to elaborate the model of its own enterprise in the Supply Chain.

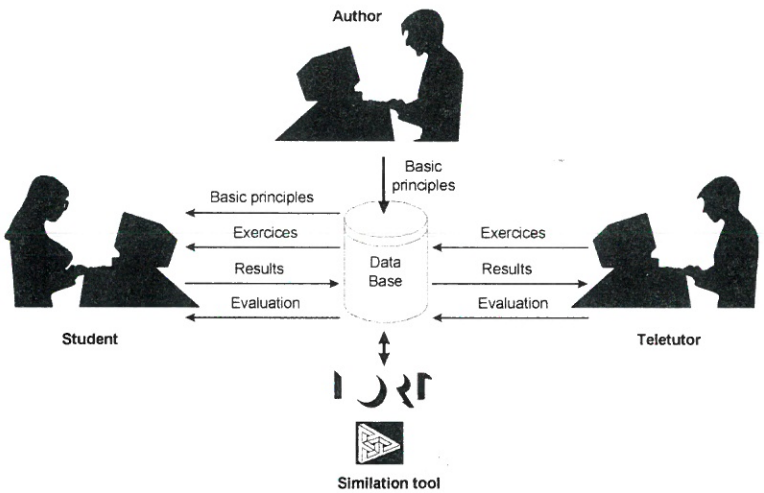

Figure 7: LOGTRAIN & WBT

An approach dedicated to the management of the evolution of the industrial enterprise

According the different elements exposed above, an approach dedicated to the management of the evolution of industrial enterprise should :

- identify clearly the guidelines of the evolution process by defining the vision and the gaps with he actual situation,
- include a « Socialisation » phase.

The proposed approach is based on automatic and systemic concepts. It proposes a model for the management of the evolution of industrial systems **[5]**. This model is decomposed into three levels :

- the « Strategic definition » deals with the performance of the ,
- the « Actions definition » focuses on the existing and the future models of the system,
- the « Project management » corresponds to an operational level and modifies the system by implementing the changes defined in the two previous levels.

The different interactions between the above three levels will result on an effective knowledge management and will increase the learning capacity of the organisation. The objective of "Strategic definition" is the global coherence of the evolution process consequently the definition of the Vision for the future system (i.e. the model of the perfect system in term of performance). Managers could imagine that this level is not directly concerned by employees defensive behaviour. Nevertheless, they must understand that each employee has already built his own Vision corresponding to his culture and to his direct environment. For this reason, managers should model an understandable global environment which integrates the different environments of the different actors of the evolution. This will lead to a common global reference which will allow to highlight the fact that future changes correspond to real needs. The elaboration of this common reference model of the evolution process environment corresponds to the first part of socialisation phase ; its objective is to break down defensive behaviour. The second level, "Actions definition" describes and defines the different steps which can be identified all along the evolution trajectory of the system. Each step should more or less affect either the structure or the operation of the enterprise. At this level analysis / design steps are put into place. Managers must be able to link these steps with the needs identified during the first level in order to reinforce the benefit of the socialisation phase and continue to eliminate defensive behaviour. This effort should be continued all along the implementation of the different stages which modifies step by step the profile of the enterprise.

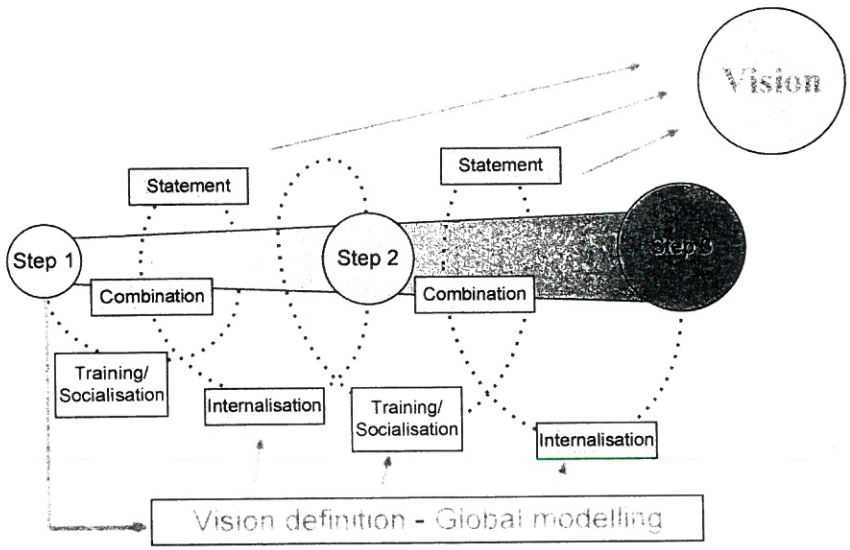

Figure 8: Evolution Management Approach

The approach is based on the multiplication of « little » projects which cumulated impacts can transform deeply the enterprise. The dynamic characteristic of the evolution process belongs to the dynamic of the different change projects. It requires organisational structure favourable to the management of different projects with numerous interrelationships and favourable to the spreading of the knowledge in order to exploit rapidly the result of each project. This structure is strongly linked with the capability of the enterprise to manage information.

When the enterprise decides to evolve from data processing to information management, its decision process, its management process as well as its running are transformed. A lot of enterprises in the world has already decided to move over this way. In order to illustrate this point, [11] gives the example of the investment decision. It does not exist a « one best way » in order to analyse an investment project.

Numerous analysis levels are necessary : investment return ratio, pay back period, risks linked to the project, opportunity cost, etc. Any accounting student is familiarised with these elements. Before the emergence of information technology, this kind of analysis would take several man / month's in order to be achieved. Today a couple of hours are necessary to solve complex cases. The information access transforms the investment analysis. It is not more an opinion but a diagnostic based on rational evaluation of existing hypothesis. The decision is no more a financial decision constrained by data but is now relevant to management decisions which take into account numerous strategic assumptions.

Once the enterprise decides to concentrate its data processing capability on information production, it can decrease the number of hierarchical levels. The role of some hierarchical levels in traditional structure is to amplify signals which compose the communication network of the enterprise. However, information is composed of relevant data which have a real meaning. Drucker insists on the fact that conversion of data into information is based on knowledge that « specialists » have. The learning organisation, in its centre, does not need any administrative actor. [12] describes an organisation which structure is a multidimensional matrix composed of teams which are specialised in a particular domain. The different actors or a team « sell » their competence to other teams in order to achieve projects. The interest of such structure is to avoid the matrix structure weakness : the fact that everybody belongs at least to two managers. The notion of manager disappears and the notion of internal customer emerge.

Conclusion

The combination of systemic concepts and organisational learning principles led us to present an approach which has been already implemented in a medium enterprise [13]. Its application demonstrated the interest of managers for such method and stressed its limits. It allows to illustrate how the introduction of training program should conduced to change that Vaillancourt names type 2. This type of project generates individual and collective modifications through a cognitive step and a behavioural step that improve the performance of the collective action [14]. Consequently, openness to change is still growing and actors are prepared to future change.

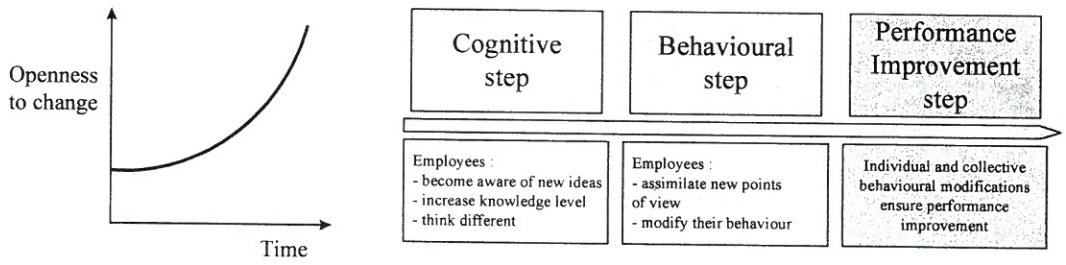

Figure 9: Second type of change

The development of the approach will continue in the Supply Chain context. In such context, partners have their own evolution processes, even if they belong to an extended structure supporting a Supply Chain. It means that they «evolve» more or less rapidly due to their needs and strategic decisions. The other partners may modify their own processes only after having undergone consequences of these changes on the flows (material, informational, etc.). Consequently, the evolution process of the whole Supply Chain accumulates delays and malfunctions : the performance of the whole Chain is never optimal. The combination of the approach with the WBT structure developed in LOGTRAIN should allow to synchronise the overall evolution process. This corresponds to the proposal e-SPY submitted in the frame of IST program.

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