

Value Management: A Methodology To Lead The Change In A Training Pedagogical Organization

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Abstract

To develop its capacities of innovation, an organization cannot be limited to the development of knowledge and competence of the individuals who make it up. It must also evolve, move and learn. This new perception of its role is not registered in its nature. It is a new state of mind, which must be developed and requires an adapted methodology. Thus, through the particular context of experimentation of an engineering school dedicated to the education and training of individuals capable of bringing innovation to industry - “product target”, our work is try to answer:

- How can we define “the ideal organization” adapted to such a training?
- What types of organization and management should we implement to allow the development of this “ideal organization”?
- In the development of “target product”, what will be the evolutions to conduct, as far as the roles of the different actors-speakers is concerned (that is to, say the teachers, the researchers, the administrative staff and the different external partners)?

We will show how the answers to these questions can lead to the proposal of an Integrated approach to Innovation.

Key words : Innovation, Value management, change

Introduction

The evolution in the apprehension of innovation implies the development of an integrated approach as a permanent process, a creator of value. This prospect requires the development of new abilities for the organization. Thus, the implementation of individual, collective, and organizational dynamics of apprenticeship, whose central object is based on the evolution of concepts of reference and on the representation of individuals, seems to be a possible trigger of development.

Thus, the vocation of an engineering school is to train engineers who will become the creators of new concepts: “target products”. Through this particular background of experimentation, our works will attempt answer the three following questions:

- How can we define the “ideal organization” adapted to such a training?
- What types of organization and management should we implement to allow the development of this “ideal organization”?
- In the development of “target product”, what will be the evolutions to conduct, as far as the part of the different actors-speakers is concerned (that is to say the teachers, the researchers, the administrative staff and the different external partners)?

We will show how the answers to these questions can lead to the proposal of an Integrated Approach to Innovation.

The context

The ENSGSI, an engineering school, was created in 1993. Its aim was to develop a teaching method in order to train engineers who must be able to cope with complex problems in all their dimensions, and to initiate and direct new actions of development.

Over the course of time, a diagnosis of the conception of this pedagogic project revealed a sequential and linear development (diagram 1), which first consisted in creating the teaching product, in implementing it in the structure of an organization then, in animating the organization itself (implementation of a quality approach).

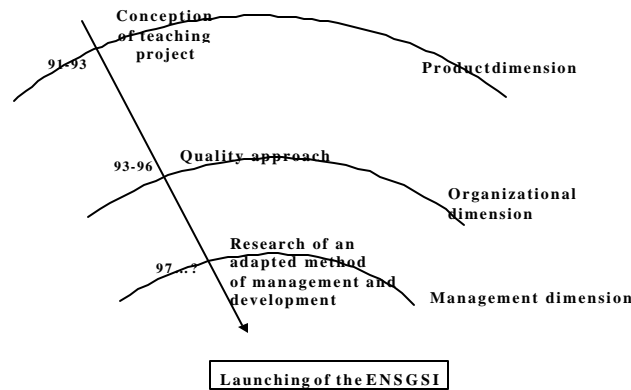


Diagram 1 – Sequential approach of the development of the ENSGSI

This sequential approach of development led to cumulate the operational problems we were confronted to on each dimension of development. This resulted in discovering the following risks:

- A tendency to rigidity or a chaotic working of the system,
- A gradual lack of responsibility caused by the increasing standardization of the system,
- An anchoring in a logic of territory due to the dwindling of the sense of the collective project.

In addition to the pervert effects of this sequential and cumulative approach of development, strong external pressures reached the system at the end of 1996. We thus needed to improve the legibility of the system, to strengthen its strategic positioning and to produce new means of the development and growth of its whole performance.

In early 1997, these operational difficulties in the classical implementation of development, and the strong sensitiveness of the system to the environmental pressures led the board of executives to rethink the development problem and to reconsider all the data, in order to transform the constraints into opportunities of development. To do that, they tried to create permanent dynamics of adjustment to the environment.

In this context, the research team of the laboratory pondered to find a method of construction to create a shared global target of the development of the organization in order to come up to those expectations.

Proposal of the use of the value analysis in order to create a shared global target of development

The chosen approach

The Value Analysis (V.A.) is a methodology of conception or we should say, of reconception, even a partial one, of the product, of its manufacturing methods, of its maintenance ...etc. It is defined by the French Standards: NF X 50-150, NF X 50-151, NF X 50-152, NF X 50-153. According to the NF X 50-150 standard, (which became an European standard: EN

1325-1), the value analysis is a creative and organized method of competitiveness which aims at satisfying the user's needs. It uses a specific approach of conception that must be economic, functional and multidisciplinary at the same time (AFNOR 85). It aims at extending the range of solutions that must be considered by taking into account the environment and market evolution. From the beginning, the V.A. is a very normative methodology of a product development. It is a "Value Management".

A possible evolution is to join up this first approach with some rules coming from the Value Management Handbook [Value 95], in order to conduct a value analysis in terms of "management by the value". This enables a:

- *A more effective and better adapted management;*
- *A better understanding and formulation of the real needs for the customers or users of the systems and products, and of the relative importance of these needs;*
- *The possibility of quantifying the arbitration between levels of performance of the functions and costs (or other factors such as weight, consumption of resources, time, social impact ...etc); this enables one to act on the reduction of the degree of ambiguity and leads to reduce time to market.*

This last aspect is very interesting for our study, as it is possible to consider another criterion than cost to qualify a function, as the AFNOR standards suggest. The methods or specific tools of the Value Management are - the Value Analysis, the Functional Analysis and the Functional Schedule of Conditions. Thus, the schedule of action "Value Analysis in order to create a global target of development", joining up the normative aspects and the Value Management Handbook rules, was held in the following way:

PHASE 1 - THE ORIENTATION OF ACTION

The orientation of an action is usually defined by the applicant, and the person who deals with the Value Analysis.

This phase consists in specifying for the considered action:

- The actors of the project
- The background of the project
- The targets

In our case, we wanted to privilege a dynamic approach of the process of construction of the device.

PHASE 2 – THE RESEARCH OF INFORMATION

During this second phase of preparation, we collected all useful information necessary to the good unfolding of the functional exam. This research was particularly carried out during meetings in which industrialists and teachers gathered in order to pre-define the expectations and opinions of the different partners.

PHASE 3 – THE FUNCTIONAL ANALYSIS

This phase, which is the most typical of the method, was achieved by the group project made up in phase 1. It aimed at determining and analyzing the functions to be ensured by working out the functional schedule of conditions.

We propose the following adapted approach:

- *To record the functions*

a. Definition and characterization of external milieus

The relevant elements of environment must be chosen, characterized and aggregated together in order to get a number of external milieus.

b. To identify the functions

The identification of the functions enables to determine the desired service, taking into account the external milieus.

- *Criteria of validation of the functions*

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The validation of the functions allows to check the stability of each of them by answering the questions: why, what for, and which development.

- *To sequence the functions*

The sequencing of the functions allows to represent the functions in a logical sequence answering the value (in term of objective) allotted to the function independently of any financial criterion. Also called FAST (Function Analysis System Technique), the resulting diagram (or functional tree) gives a synthetic vision of the product's functions.

- *To develop and treat the functions on a hierarchical basis*

The treatment of the functions on a hierarchical basis allows the classification by an order of importance allotted to each of them by the Value Analysis group. The valorization will be done by highlighting the variations between the energy really developed in-house, in order to reach the functions and the desired system, and by the proposal of paths of evolution.

The results of functional analysis

Characteristics of the followed method :

We wanted to define the value allotted to each function. To do that, we used the FAST method with a result orientation. Thus, we first propose the diagram corresponding to the period of time $T = 1997/1998$, then we give an outline of the desired shift of the functions $T + n$. *A projection in the future must be done* as long as the environment is not disturbed. The results are respectively presented in diagram 2 and 3.

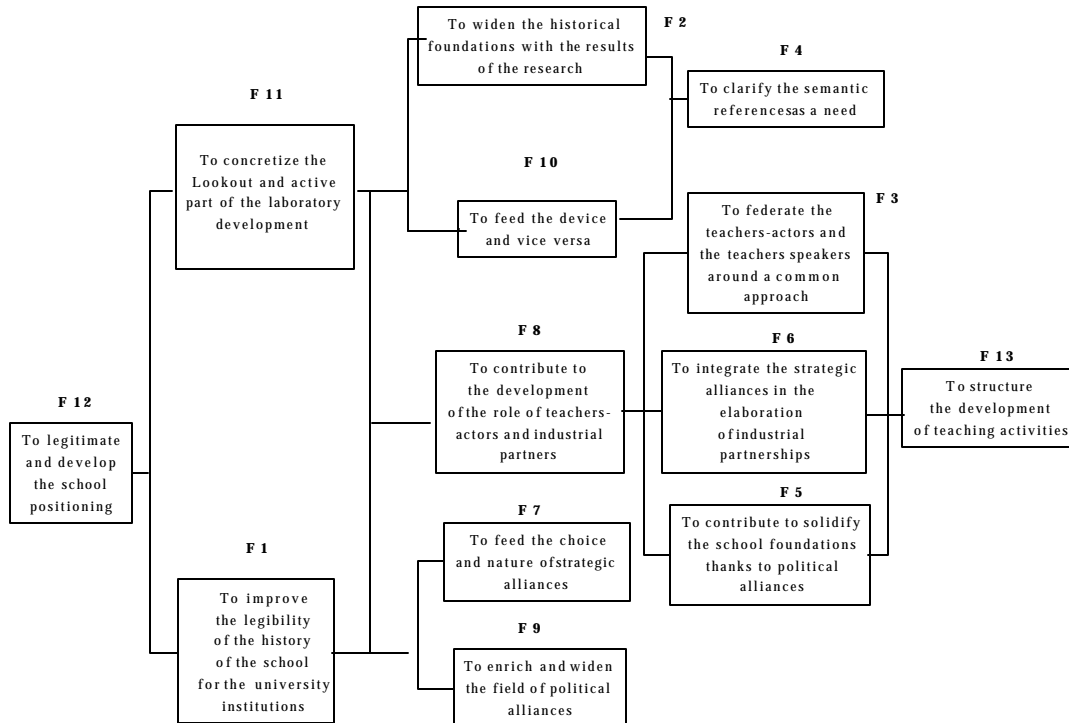


Diagram 2 – sketch of the functions' sequencing at $T = 1997/1998$ according to the FAST method

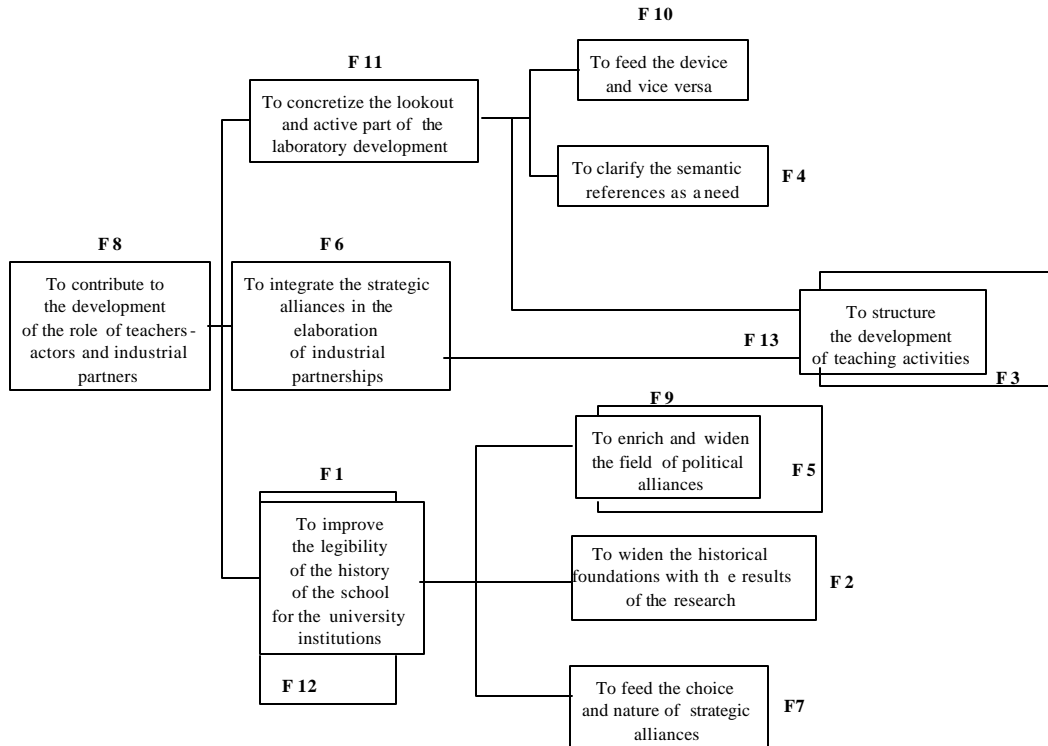


Diagram 3 – sketch of the desired sequencing of the functions at $T + n$ according to the FAST method.

In this configuration, we must underline the fact that the functions of the training device, which must allow to:

- *Legitimize and develop the school positioning (F12)*
- *Contribute to solidify the school foundations thanks to political alliances (F5)*
- *Federate the teachers-actors and the teachers-speakers around a common approach (F3),*

Have an intensity which tends to grow blurred for the benefit of the functions respectively described below:

- *To improve the legibility of the history of the school for university institutions (F1)*
- *To enrich and widen the field of political alliances (F9)*
- *To structure the development of teaching activities (F13)*

The functions of the training device contribute to feed the other functions.

The development of the functions on a hierarchical basis

We choose the Efficient Time Invested (ETI) to create a function, as a hierarchical criterion. The valorization has been done by highlighting the connection between the real energy developed in-house to create a function, the RETI, and the desired one, the DETI. The results are presented in the following diagram:

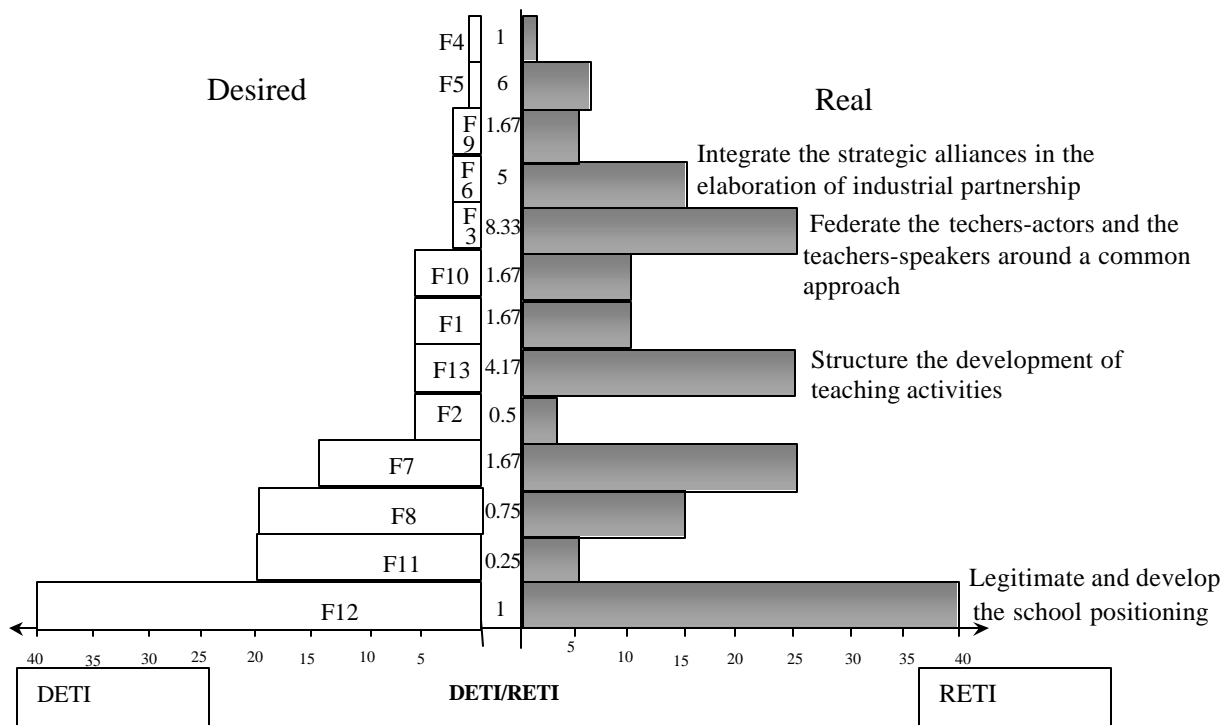


Diagram 4 – Treatment of the functions according to the Efficient Time Invested criterion

The results of calculation of RETI/DETI lead to a certain number of conclusions and proposals for an evolution:

- If the ratio is higher than 1, the energy puts on a function is higher than what one would have wished. On the basis of the fact that the available energy is wholly equal on a system, one can assume that it reacts on other functions which are not granted enough interest.
- If the ratio is lower than 1 or very close to 1, it is the opposite case of the situation stated before.
- A ratio equal to 1 allows one to assume that overall, the direction is maintained as far as the approach is concerned.

One can notice that a certain number of imbalances exist. One must thus wonder if they really correspond to the whole strategy exposed.

We can state that the general objective is relevant and that the direction of the approach is confirmed (F12: *the training device must allow legitimatization and development of the school positioning equal to 1*), but its development leads to strong imbalances:

Higher than 1 for the functions

- *federate the teachers-actors and the teachers-speakers around a common approach (8.33)*

- *integrate the strategic alliances in the elaboration of industrial partnership (5)*
- *structure the development of teaching activities (4.17)*

Lower than 1 for the functions

- *concretize the lookout and active part of the laboratory development (0.25)*
- *widen the historical foundations with the results of the research (0.5)*
- *contribute to the development of the role of teachers-actors and industrial partners (0.75)*

The year 98/99 was to contribute to the inversion of the preceding ratios. The only particular point is the F13 function “*to structure the development of teaching activities*” which suggests the implementation of a long-term piloting through the development of a tool allowing to federate teachers.

The approach has an impact on the total strategy because it acts on the quality of implementation and enables the correction of mistakes. The energy being generally constant in the system, the background “new school” and the increasing number of students contribute to the fact that all the inspired energy is not necessarily used where it should “theoretically” and in short term be. Thus, the efforts are centered on the research of a local equilibrium between the functions:

F3: *federate the teachers-actors and the teachers-speakers around a common approach*

F6: *integrate the strategic alliances in the elaboration of industrial partnerships*

F13: *structure the development of teaching activities*

Through a relevant and developed communication targeted on the internal and external aspect at the same time, and through the integration of risks and disorders in the research laboratory. From this point of view, the laboratory proposed some tracks of development of a tool for adjustments to industries and employees. It is the development of a prototype, the Reference Employment / Capacities (REC) of the trained students [Morel and al 98], and of its implementation in the school. The latter supports the bringing together between the industry (its needs) and the school, by a permanent process of adjustment. It also enabled to clear away the F12 function (*legitimate and develop the school positioning*) and to balance the functions F3, F6, and F13.

Conclusion

The value analysis, adapted to our pedagogic background and conducted within our school, leads to interesting proposals as to the initial questions, and to the elaboration of a whole strategy to follow. Furthermore, we want to emphasize the fact that the value analysis is presented as an approach ensuring a good compromise between pragmatism and creativity. As a matter of fact, one must not propose solutions which, most of time, correspond to existing things, but one must suggest possible paths of development in term of functions to be filled. Moreover, the iterative aspect of each stage (one can come back to a former stage at any time) grants the VA a characteristic of constructivist design, in keeping with our research. It also vouches the

possibility of retrospective effects present in the dynamic models and in adequacy with the needs of an integrated approach to innovation and development.

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