

Modeling of the Systems of Piloting In Training Institutions

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Abstract

From a globalization and complex environment ,point of view the evaluation of the educational system turns out to be an imperative .The performance indicators allow to characterize the evolution of the educational systems in their contribution to the enhancement of the general level of training.

This article aims at presenting an approach to the elaboration of the strategy of the systems of production of skills. This method is inspired by the current approaches in numerous sectors of the systems of the production of goods and services. The proposed approach allows us to have a model of the system in question and a structured expression by its strategy before defining the structure of piloting based on three operational, organizational and strategic levels.

Keywords: Modeling , Regulation , Control , Process , Education system

Introduction

The systems of production of skills are a partial class of the systems of production of services. Their main mission is to train women and men .We are interested, more particularly in the piloting section , We believe that the organisms of training will have to face permanent transformations to favorably meet the needs of the evolution of society as a whole, and more particularly of companies whatever their mission and their objectives are.

This article also attempts to show that engineering sciences can help the chiefs in charge of establishments in the deployment of their strategy as well as in the piloting of the projects of modernization.

- In the first part we shall present the problem of evaluation of the systems of training
- The second will consist in presenting indicators and assessment of measurements
- In the third part we shall propose a modeling of the system of piloting according to three levels: operational, organizational and strategic.

I – The problem of the evaluation of the systems of training

I-1- The notion of evaluation

This evaluation can be defined as the measurement of the gap between fixed objectives and attained results.

I- 2 - Brief panorama of definitions

The variety of the terms and the definitions of the word “evaluation” reveals its complexity which we are going to try to clarify

- “To Educate and Train “, Jean-Claude Ruano-Borbalan⁵ differentiates between:
- The summative evaluation which "consists in establishing a balance assessment of knowledge acquired by the learner "
- The formative evaluation which " measures the performances of the learner according to his or her start level ". Développer les compétences (Developing skills), André Guittet introduces new evaluative terms:
- The diagnostic evaluation prior to training allows to " place performances, detect potentialities, diagnose and direct "
- The formative evaluation while training practices " a pedagogical regulation function "
- The “certifying evaluation (or summative)” after training " certifies, and checks qualifications ".

In “Ingénierie et evaluation des competences " (engineering and evaluation of the skills), Guy Le Boterf notices that " the problems of evaluation can be resolved correctly only if they are tackled from the conceptions of training initiatives . It is the notion of " reference tables of exploitation, jobs and training which will serve as criteria of evaluation ".

For François-Marie Gérard " the systems of training are subjected today more than ever to an important pressure to estimate their return to allow a better piloting.

I-3 – Evaluation at different times

The choice of the moment of the evaluation depends on the objective of the evaluation ,is itself defined according to the function of the person in charge together with the resources assigned, to the evaluation and to a lesser extent all the participants within this system and their variety of expectations as to the training.

We can evaluate:

- Before the implementation of the system, to make an diagnostic evaluation which determines the objectives of the training and the prerequisites of the learning.
- During the training, to make a formative evaluation which pilots and directs the progress of the learning.

After training, to make a final evaluation which yields the results of the level of satisfaction of the learners, the acquired knowledge, the skills of the efficiency of the training ,the relevance of the system of training to resolve the problem, the durability of the effects of the training, and finally of the continuity of the system of training.

✓ Why estimate ?

The evaluation maybe a "weapon" in the case of the diagnostic , piloting and certifying evaluation controls.

Today we go back to a general logic of " everything must be estimated ", not to check but to analyze the implementation, the results and the effects of the assigned objectives and the means that were assigned by a public policy or a program. This logic is coherent with the evolution of the contractual practices, the requirement of the economic efficiency and the will of the autonomy of regions.

✓ Estimate what ?

Having defined the field of evaluation, it will be a question of estimating the relevance, that is the adequacy of the project with needs ; the coherence, that is the synergy of the various objectives of the project between them; the efficiency, that is the effects of the project with regard to the objectives; the efficiency to know the relation between the available resources to reach the objectives and the planned results; the impact which measures the global effect; the durability that is the capacity of the project to generate expected long-term effects.

✓ Who evaluates ?

It is necessary to know who is the financier and which are his objectives through the evaluation; it will also be necessary to know who will practice the evaluation

✓ Estimate when ?

According to progress of the project, the evaluation must be conducted before the establishment of the project, or during its implementation, or at the end of the project.

✓ Evaluate with regard to what ?

The necessity of having defined clearly reference tables, that is of locating a context and of building a body of data relative to one or several situations which will serve to measure differences.

✓ Estimate with which tools ?

Tools will be elements of judgment, or criteria which correspond to a point of view to examine a situation, which will be measured by means of indicators or signs allowing to compare a realization with regard to the other one, or to different periods or with regard to a standard.

✓ **Evaluate How?**

The characteristics of the evaluation and its implementation will be specified in a specifications clarifying the used means (survey, meetings).

II – Indicators and taking of measures

II-1 – Notion of indicator

A performance indicator is a criterion of measure of respect for the objectives fixed by the conduct external management of the unit organization.

According to [Pourcel] the indicator has to possess three essential characteristics:

- Be quantifiable, that is to take a clearly defined value
- Be measurable, device must be able to give a value
- Be programmable to define a period of validity of this one, in touch with the period of the objective to control.

Berrah [99] proposes a definition of the indicator " as a performance indicator is an expression - more or less valid - who measures the performance of all or any of a process or an activity of a system (real or sim). With regard to an objective. This simulated expression is possibly expressed so as to be estimated with regard to the global nature of the objectives of the system towards the context of progress of the activity or the process or the considered system.

II-2- Performance indicators of a system of training

- **For the Level Strategy**
The strategic indicators corresponds to the profitability of the system of training(formation), they are grouped together(included) in structural indicators (financiers) and cyclical indicators (strategic objectives)
- **For the Organizational Level**
Indicators reflect the competitiveness of the system of training bound(connected) to the technical performance of the processes, they include the peripheral activities in the training.
- **For the operational Level**
Indicators allow the measure of the performance of the units of training(formation) through the productivity of the resources, they consider only the productivity from the use of the resources.

II-3 – Identification of the performance indicators of a system of training

The figure 1 illustrates performance indicators inspired by the railing of Berrah (Organizations of indicators, p 153), we adapted it to the system of training by respecting paradigm stains - Skill - Actor – Activity

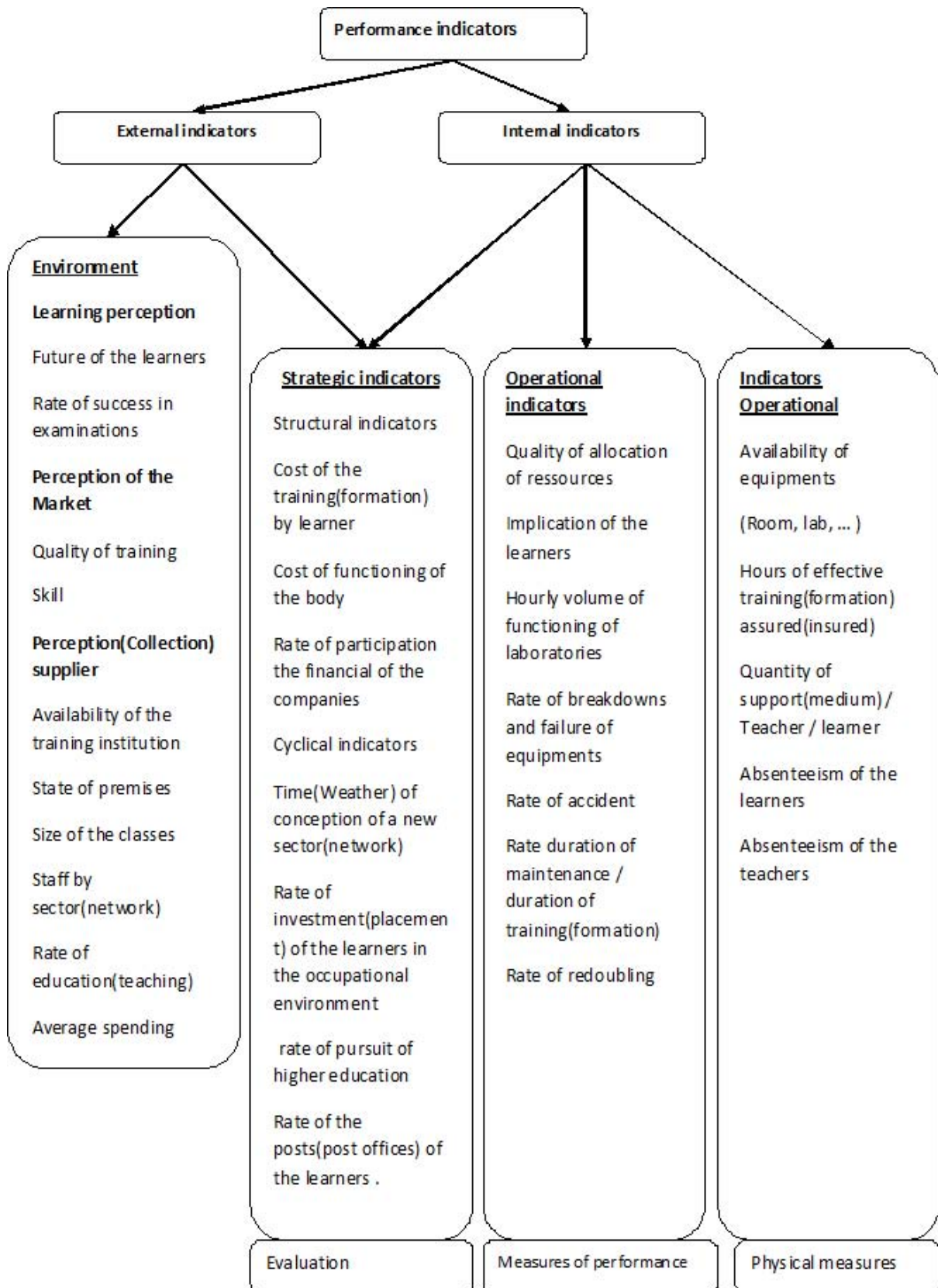


Figure 1 : Performance indicators

III- Modeling of the system of piloting

We can consider that from a macroscopic point of view, a system of piloting has to fill

two missions which are:

- To Measure the behavior of the system in a regular and precise way to supply relevant performance indicators in the part commands.
- Overpower the functioning that is to supply control levers of action allowing to influence the effective part to correct detour and react effectively in front of disturbances.

Among the main existing structures of piloting, it is necessary to determine the one of which structures it supplies the features the most adequate to our problem, to build our system of piloting.

III-1 – Modeling of the system of piloting exploitation

These decisions are taken in the short term and aim at making sure of the good progress of the activities of the training institution.

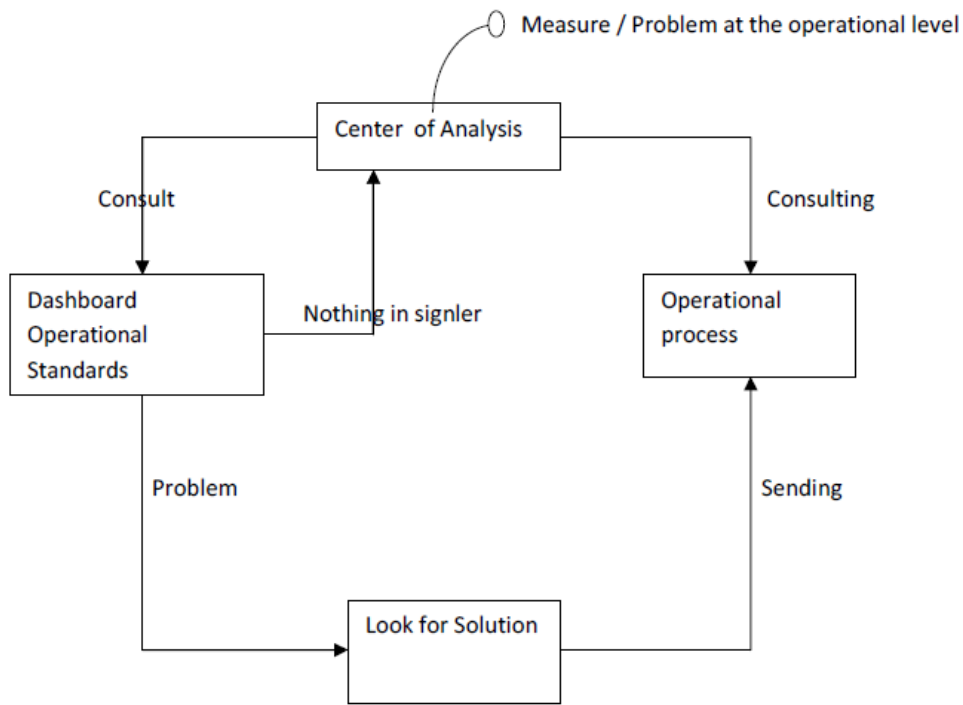


Figure2: modeling of the operational level

III-2 – Modeling of the system of piloting engineering

These decisions are taken in the medium term (for example one year) and aim at assuring the connection between two other levels by guaranteeing the coherence of the led actions.

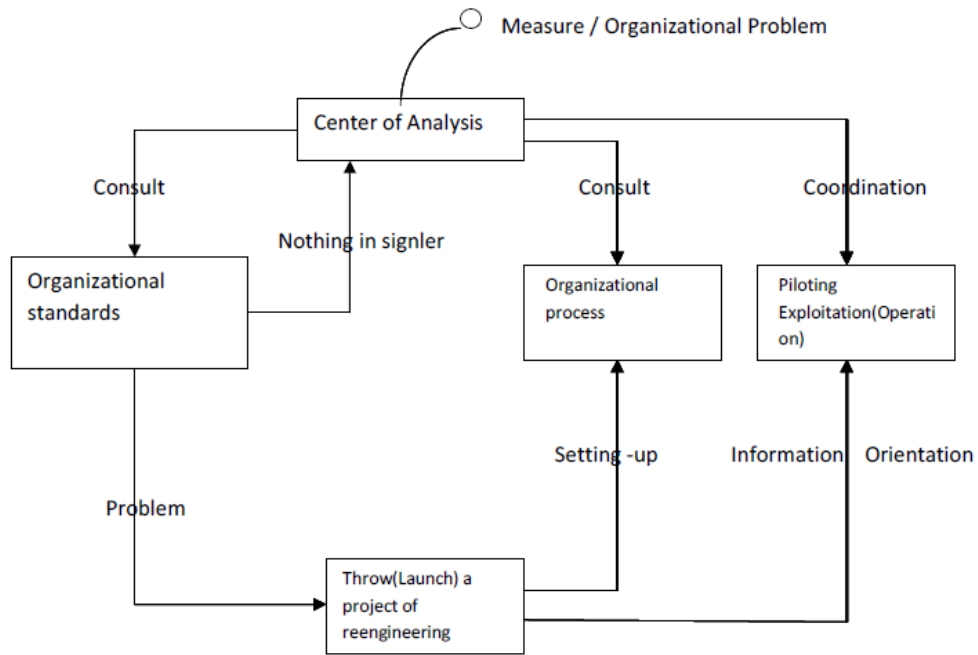


Figure 3: modeling of the organizational level

III-3 – Modeling of the system of strategic piloting

These decisions are taken in the long term (four years for a training institution within the framework of a four year plan) and defining the strategy of the considered body.

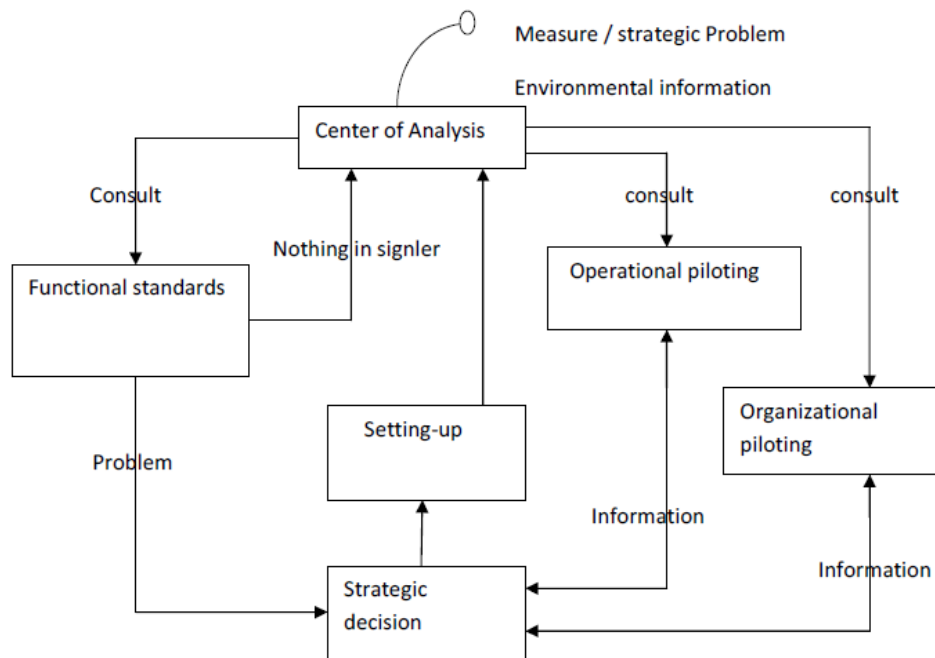


Figure 4: modeling of the strategic level

Conclusion

We presented in this article a method of modeling of the systems of piloting adapted to the systems of training, based on the structure of hierarchical piloting. The originality of our method is situated in the fact that we combined several methods of piloting for propose it a system of generic piloting to the future users who accompanies them in each of the phases, the definition of the strategy until the definition of the operational objectives

However, The system of piloting presented here very general and is modeled only at a global level. To be directly useful, it would require to be detailed until a finer grading level. Indeed, our modeling stops at the level of the cartography and every process would deserve to be clarified and modeled with attention.

REFERENCES :

- [1] HAREL .D .Statecharts .1987 . a visual formalism for complex systems ,Science of computer programming , Vol 8 , P 231-274
- [2] LEVY LEBOYER C . 1996. The management of skills .editions of organization.Paris
- [3] AMICE 1993 , Consortium AMICE .CIMOSA : Open systems architecture for CIM. 2nd edition Springer-Verlag ,Berlin
- [4] MARTIN .J , MCCLURE.C1985 .Structured techniques for computing.prenticehall In , Englewood Cliffs , NJ.
- [5] ANONY R 1965.Planning and contrôle systems : a framwork for analysis . Boston , Havard Univesity Press 1965
- [6] BERNUS.P , NEMES.L 1999.Organasational design : dynamically creating and sustaining integrated virtual entreprise , In HF .chen DZ.cheng , JF .Zhang (Eds) , proc .IFAC World Congress , Vol A , Elsevier , Londres 1999
- [7] LEBOTERF G . 2011 . Enginnering and evaluation of skills . editions of organization .Paris
- [8] POURCEL. C , GOURC .D . 2005 . Modelling of enterprise by process : activities , organization & applications . editions Céapdues . Toulouse.
- [9] CAMBAZARD H, al. 2004 .Interactively solving school timetabling problems using extension of constraint programming. In 5th International conference for practice and theory of automated timetabling , PATAT04 , Pittsburgh.
- [10] POURCEL C 1976 . Application of modeling and hierarchical operation to a medium size production. symposium IFAC ,Toulouse.
- [11] CANNOR , PE . Organization 1980 . Theory and design ,Science research associates , Chicago
- [12] VERNADAT FB :1996 . Entreprise Modeling and Integration : Principles and applications .Chapman&hall , London
- [13] WILLIAM TJ . 1992 . The perdue Entreprise Reference Architecture, Instrument Society of America, Research triangle park NC.
- [14] SAAD. A , KAWAMURA .K , BISWAS .G .1997 .performance evaluation of contract net –based hierarchical scheduling for flexible manufacturing system.Intelligent Automation and Soft Computing.3(3) , 229-248.