International Journal of Research in Education Methodology
Volume .2 No. 2 February 2013, ISSN :2278-7690

Modelisation and simulation of piloting's systems for a training organization

Mehdi.ABID ,Aziz.ATMANI, B.NSIRI, B.BENSASSI
Laboratoire d'informatique et d'aide à la décision .
Faculté des Sciences, Université Hassan II.
Casablanca Maroc
Laboratoire d'automatique et thermique
Microélectronique et des matériaux de sciences physiques
Faculté des Sciences, Université Hassan II.
Laboratoire d'automatique et thermique
Microélectronique et des matériaux de sciences physiques
Faculté des Sciences, Université Hassan II.
Casablanca Maroc
Laboratoire d'informatique et d'aide à la décision .
Faculté des Sciences, Université Hassan II.
Casablanca Maroc

Abstract: The current production systems are growing in complexity. This complexity results for a large share of market demand, competition, quality and the density and diversity of products they handle. A typical example of a complex system, commonly used in the industry is that structures flexible job-shop.

These systems are able to adapt to possible changes of the environment. They have a large variety of product flows with arbitrary sequences of production, including cyclical phases (multiple operations of the same flows on the same resource). The objective associated with this type of system is then to ensure treatment varied as possible with maximum productivity at lower cost.

Key words: modeling, simulation, performance indicators, operational management, organizational control, strategic management.

I-Introduction:

We can consider a macroscopic point of view, a control system must fulfill two missions are:

Measure the behavior of the system on a regular basis and to provide accurate performance indicators relevant to the control part

Understand the operation that is to say, provide levers for influencing the operative part to correct deviations and effectively respond to disturbances.

Among the main driving existing structures, we must determine that the architecture provides the features most appropriate to our problem, to build our management system.

II-Indicators and action

A performance indicator is a measure used to evaluate compliance with the objectives set by the outer pipe of the organizational unit.

According to [Pourcel] indicator must have three essential characteristics:

Be quantifiable, that is to say, taking a clearly defined value

Be measurable, that is to say that any device should be able to give a value

- Being programmable to set a validity period thereof, in relation to the period of the objective test piece.

Berrah [99] proposes a definition of the indicator as a "performance indicator is an expression of - more or less valid - which measures the performance of all or part of a process or system activity (real or simulated). Compared to a target. if this expression is expressed to be assessed in relation to the overall objectives of the system under the context of the conduct of the activity or process or system considered

As part of the overall system modeling training, there is the control part is characterized by its three levels of decision (Operational level - organizational level and strategy level).

*For the strategic level:- Strategic indicators corresponds to the profitability of the education system, they are grouped into structural indicators (financial) and economic indicators (Strategic objectives)

*For the Organizational Level:-Indicators reflect the competitiveness of the training related to the technical performance of the process, they include peripheral activities training.

*For the Operational Level:-The indicators measure the performance training units through resource productivity, they consider only the productivity from the use of resources.

International Journal of Research in Education Methodology
Volume .2 No. 2 February 2013, ISSN :2278-7690

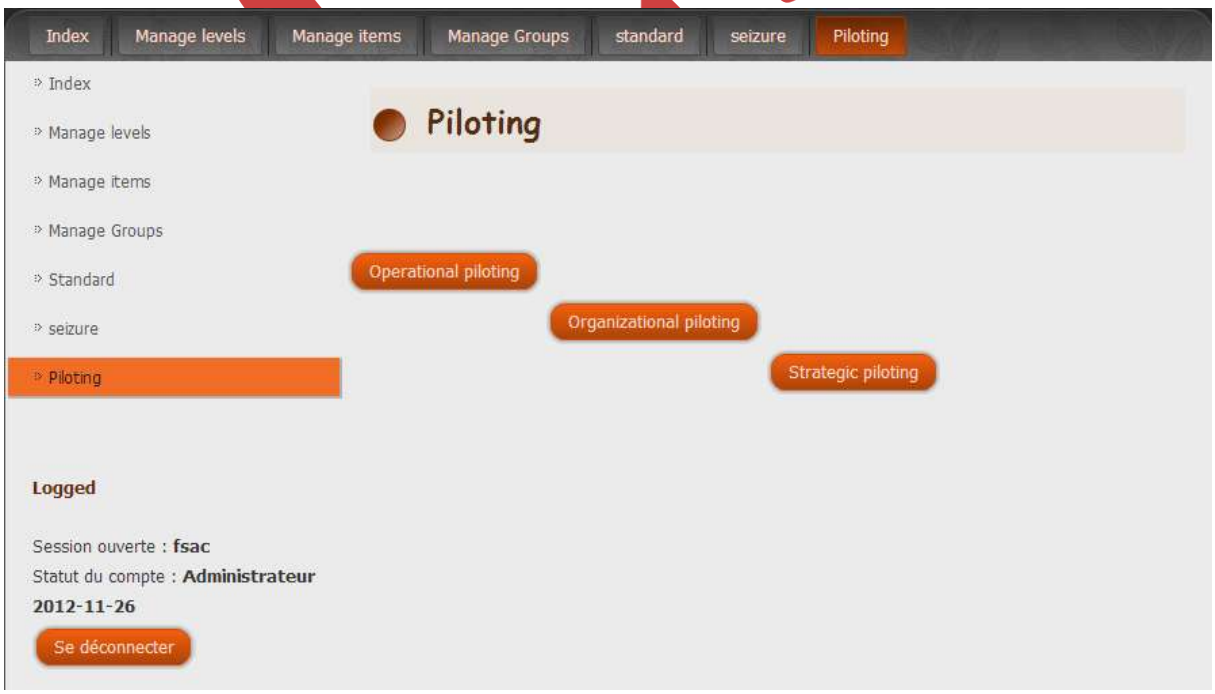
III Modeling and Simulation System Control

III -1 – Introduction:

We can consider a macroscopic point of view, a control system must fulfill two missions are:

Measure the behavior of the system on a regular basis and to provide accurate performance indicators relevant to the control part
Control the operation that is to say, provide levers for influencing the operative part to correct deviations and effectively respond to disturbances.
Among the main driving existing structures, we must determine that the architecture provides the features most appropriate to our problem, to build our management system.
The deployment method SIPRE (Système intégré de Pilotage réactif), inspired by the deployment method of balanced scorecards (Kaplan, 03), is derived in nine steps:
1. Definition of the general strategy of the training organization in question. Normally, this step is already done before the deployment of Sipre because it is essential for the functioning of an organism. However, it can be plug streamline and specify the strategy;
2. Definition of strategic objectives. Responsible for the implementation of SPIRE chosen among those proposed strategic objectives that fit his system and its adjoining strategy;
3. Definition of key success factors. Based on the general strategy, we must define the Key Factors of success, which will give us the goals and constraints of the system. Like the definition of strategic objectives, the user can choose among the key success factors those which correspond to the strategy;
4. Realization of the cause-effect diagram that links strategic objectives and define them influence each other.
5. Adaptation of the generic mapping process proposed. Mapping we propose to be exhaustive. In fact, all the processes that we present are not necessarily present in all educational institutions. It is therefore necessary to retain only those existing in the current system;
6. Implementation of measurements. The monitoring function is essential to do so, we defined a set per-process measures. Again, all will not necessarily be required with respect to the body control and a selection of relevant indicators is needed. Matrix of influence processes on Key Success Factors that helps the user in this task;
7. Grouping of indicators table (s) on board. The measuring sockets can be useful for operational local decisions, but in case of trading or reporting to the trunk, it is necessary to present them in the form of synthetic dashboards. Operation to be carried out by aggregation;
8 Implementation of the control structure. by instantiating Roots, Trunk and the circuits necessary communication;
9. Definition of operational objectives and action plans. which are the lowest branch of the strategy and processes are the tasks for the current performance of the system.

Figure (1) : Control interface



International Journal of Research in Education Methodology
Volume .2 No. 2 February 2013, ISSN :2278-7690

III -2 – System piloting operational

The operational model allows us to characterize the operating performance of the production system. The business model should therefore provide IP-model results related to the management of daily production system competence (absence of learners, absence of teachers, performed hourly load, rooms etc.). These indicators are related to operating system

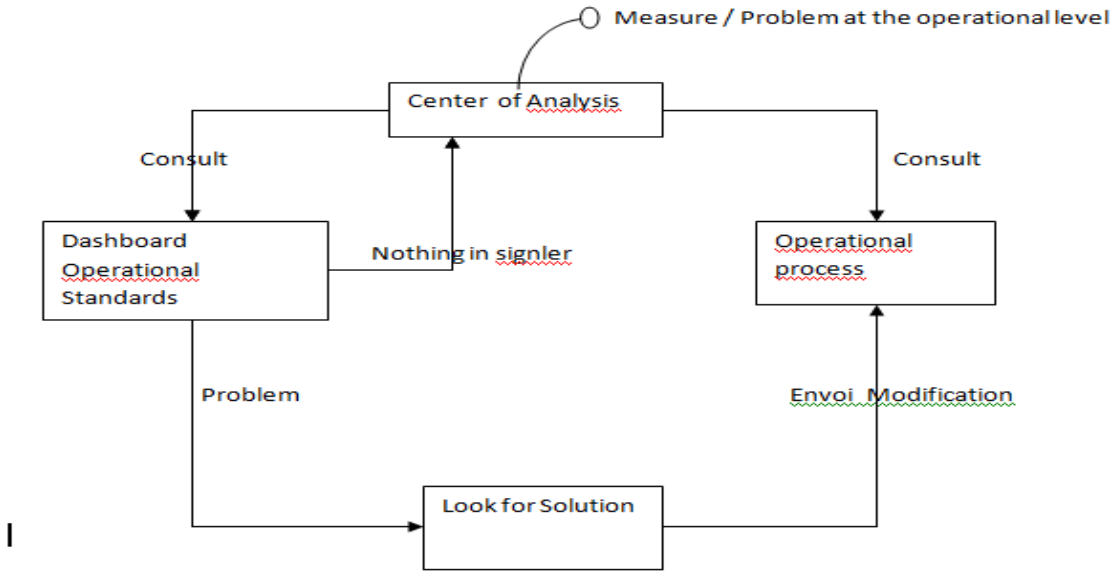


Figure (2) : System modeling operational piloting

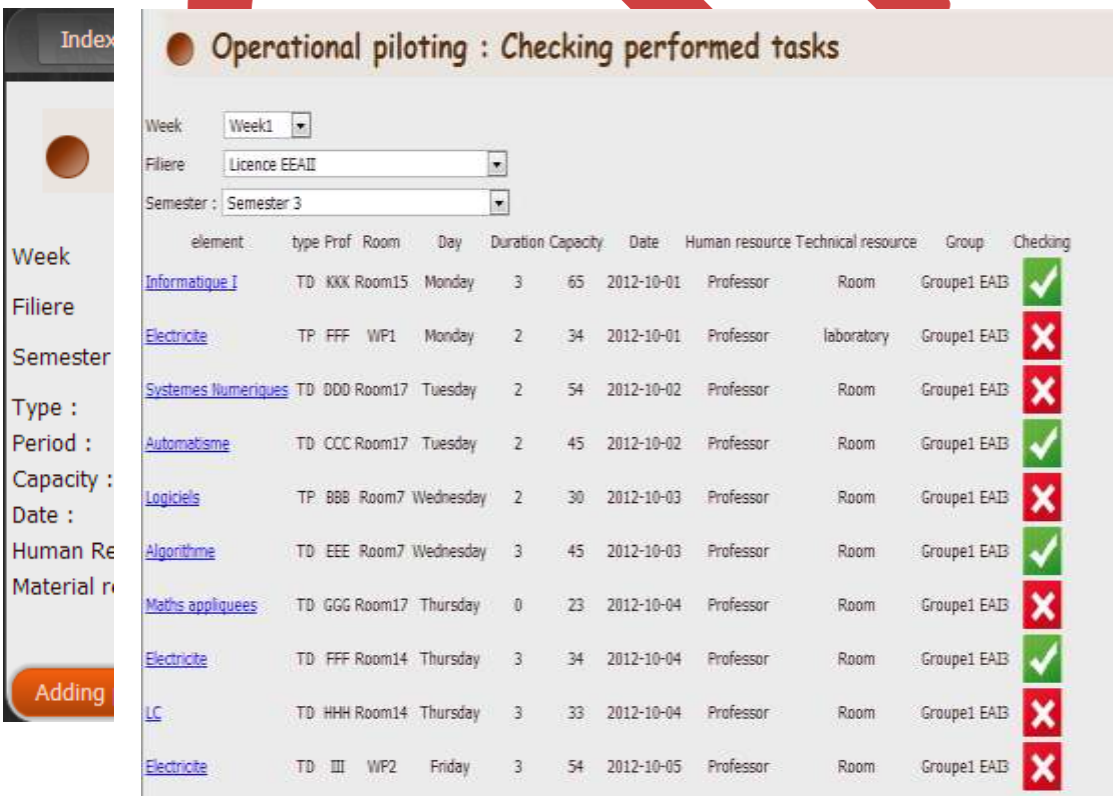


Figure (3) : System modeling operational piloting

III -3 –Piloting organizational system

Engineering is to convert all or part of the system, based on indicators of progress established by the level of strategic management, reasoning on organic models and operating system.

Organic standards to measure the efficiency of the organization implemented to achieve the functionality of the new system defined above. IP-structural model of steering quantify the productivity of the organization (eg, success rate) related to volume and variety of production and indicators of process control operations.

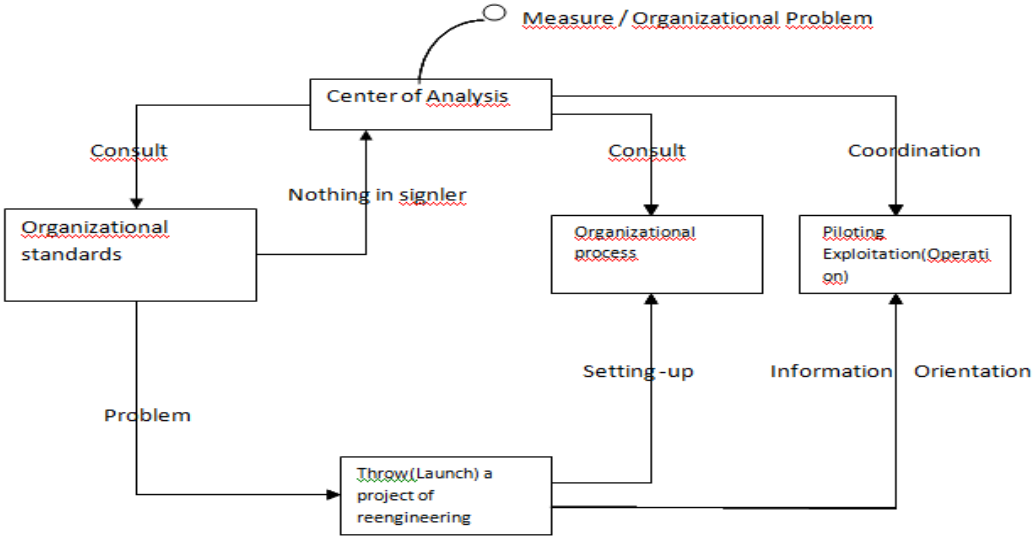


Figure (4) : Modeling of piloting system (Ingénierie)

Figure(5): Modeling **of** piloting organizational system

III -4 – System modeling piloting strategic

System modeling strategic piloting the "supervision" of a production system and the establishment of performance indicators dedicated to this monitoring can ensure that the system maintains its economic function in its environment and trigger a re-engineering project if need. Performance is relative to the market. Attention must be paid, on the one hand, the internal variations of the system and, secondly, to environmental changes of the system. On this last point, we have analyzed the interest of technical functions ensures that "scan" the environment for possible variations. Any technical function monitoring is associated with one or more side indicators (increased demand, competition study, etc...)

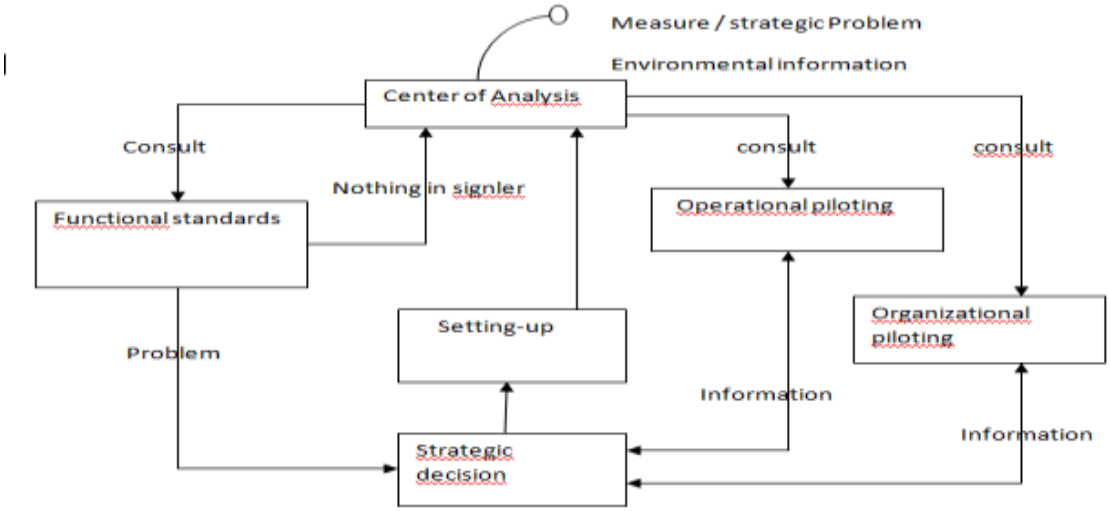


Figure (6): Modeling of piloting system (strategy)

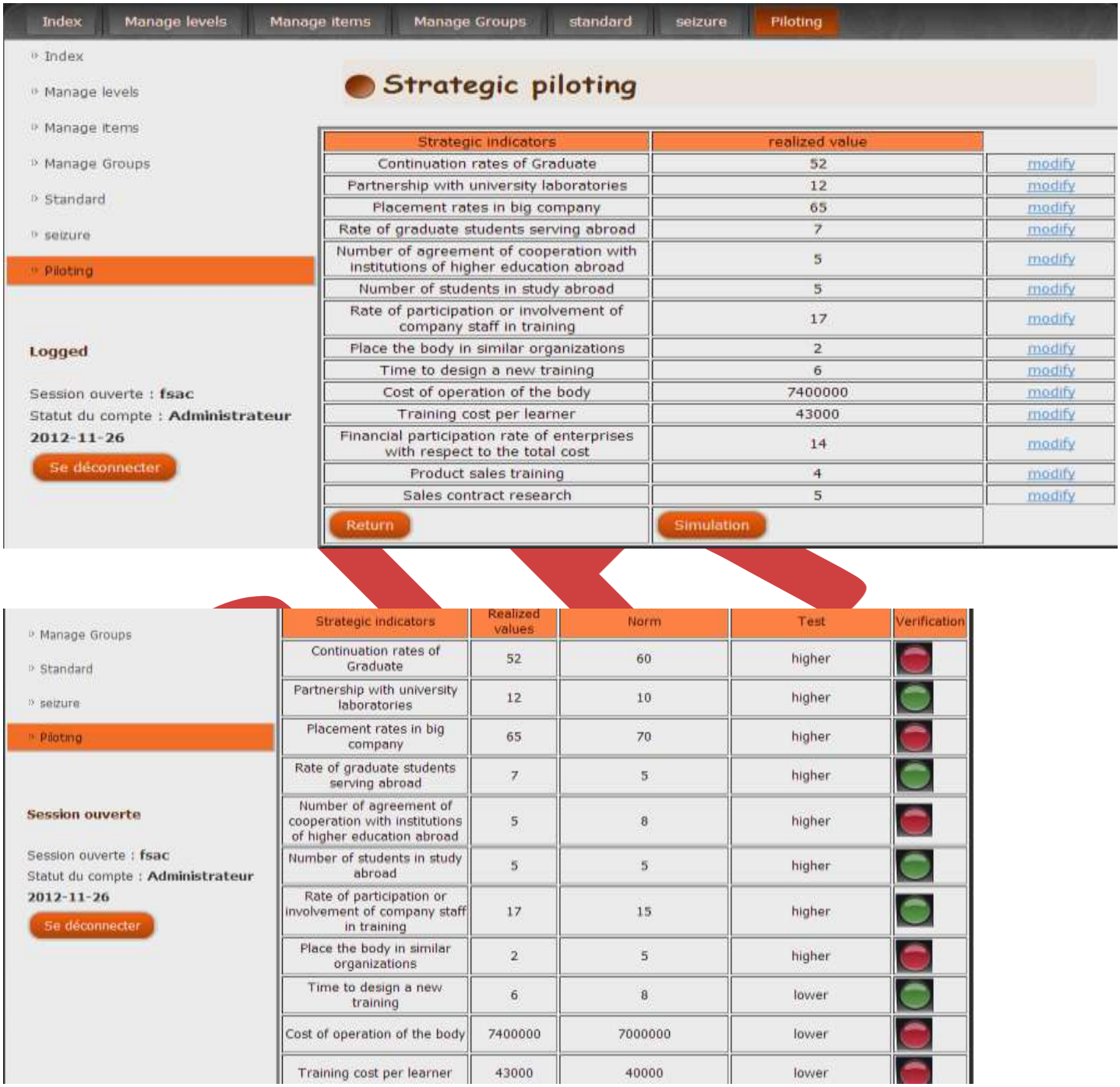


Figure (7): System modeling of piloting strategic

III -5 – Conclusion:

We present in this paper a method of modeling and simulation of control system of a training organization based primarily on the method of balanced scorecards while drawing standard FD X 50-176 and the method GIMSI. The originality of our approach lies in the fact that we have combined these methods to provide a particularly suitable for our type of system users by providing a framework for future implementation defined in the accompanying each phase. We propose to users, in addition to the method itself, select items that reflect their mode among those that offer them.

REFERENCES:

[1] Ershler et Grabot, 2001 Ershler J. et Grabot B., “Gestion de production : fonctions, techniques et outils”, Paris,

[2] Hermès Science Publications, 2001.

International Journal of Research in Education Methodology
Volume .2 No. 2 February 2013, ISSN :2278-7690

[3] Feng Y. and Xiao B., “Optimal threshold control in discrete failure prone manufacturing

system”, IEEE Transactions on Automatic and Control, Vol. 7, N° 47, pp.1167–1174, 2002.

[4] Ferrier J.L., “Modèle et système : un tour d’horizon”, Notes de cours de DEA automatique et informatique industrielle, Université d’Angers-Ecole centrale de Nantes, disponible sur : www.istia.univangers.

[5] WILLIAM TJ. 1992. L'perdue Entreprise Architecture de référence, Instrument Society of America, Research Triangle Park NC.

[6] transportprocesses”, Thèse de doctorat, Ecole Polytechnique Fédérale de Lausanne, Suisse, 2005

[7] Vernadat FB, 1996. Entreprise Modélisation et intégration:. Principes et applications Chapman & Hall, Londres

[8] Anony R 1965.Planning et les systèmes de Contrôle: un framework pour l'analyse. Boston, Harvard Univesity Presse 1965

[9] BERNUS.P, NEMES.L conception 1999.Organasational: créer dynamiquement et le maintien intégrée entreprise virtuelle, en HF chen DZ.cheng, JF Zhang (Eds), proc IFAC World Congress, Vol A, Elsevier, Londres... 1999

[10] LEBOTERF G. 2011. Enginnering et l'évaluation des compétences. éditions d'organisation. Paris

[11] CanNor, PE. Organisation 1980. Théorie et la conception, de la Science Research Associates, Chicago

[12] Akyol and Bayhan, 2007 Akyol D.E., Bayhan G.M., “A review on evolution of production scheduling with neural networks”, Computers and Industrial Engineering, Vol. 53, N° 1, pp. 95–122, 2007.

[13] Alla and David, 1998 Alla H. and David R., “Continuous and Hybrid Petri Nets”, Journal of Circuits, Systems and Computers, Vol. 8, N° 1, pp. 159–188, 1998.

[14] Altiparmak et al., 2007 Altiparmak F., Dengiz B. and Bulgak A.A., “Buffer allocation and performance

[15] (AFIS, 04), collectif, « Glossaire de l’Ingénierie Système », GT IS, http://www.afis.fr, France(Le Boterf, 98), Le Boterf G, « L’ingénierie des compétences », Editions d’organisation,Paris, France

[16] (Braesch, 02), Braesch C, « La méthode OLYMPIOS », Actes de l’Ecole de Printemps sur la Modélisation d’Entreprise, Ecole des Mines d’Albi Carmaux, Albi, France