

# Which architecture of information for the organizational suppleness: case of the port of Agadir

O. Z. Ouariti<sup>1</sup>, A. Elmenssouri<sup>2</sup>, H.M. Hamri<sup>3</sup>

<sup>1</sup> ERETTLOG, National School of Business and Management, Université Ibn Zohr, Agadir Morocco

<sup>2</sup> ERETTLOG, National School of Business and Management, Université Ibn Zohr, Agadir Morocco

<sup>3</sup> ERETTLOG, National School of Business and Management, Université Ibn Zohr, Agadir Morocco

## Abstract

Nowadays the needs for management of information is very important in companies, in particular information which (who) concerns the services (departments) and the functions (offices) which have a considerable weight in the organization, to become a key factor of competitiveness for any company. The stake is very important when we touch the information of traceability in the organizational management. In this work, we shall answer the question: " to what extent the institution of an effective information system leads (drives) to the efficiency of the management of organizations ", by the conception (design) of architecture of information allowing to improve the existing system, which establishes (constitutes) the starting point of the conception (design) of an information system of traceability bound (connected) to the organizational management.

**Keywords:** Information system, information, organization, competitiveness, port.

## 1. Introduction

In an unstable context imposing permanent questionings at the level of the management of organizations, the company is in front of the imperative to improve its adaptability so as to be more flexible and reactive in front of managerial situations considered an increasing complexity (1), (2).

Originally, seen as a controllable operational element, the information became, under the pressure of an evolution accelerated by the techniques of information and a rhythm of globalization and greater competition (competitors), a considerable strategic resource today. Practices which for the greater part open up the productive activities and favor the enrichment of the skills and the greater autonomy of

the actors. (1), (3), (4), y putting the latter in the center of its concerns, organizations enjoys a certain competitive advantage: wherever from the importance of the place(square) occupy information systems as essential factor(mailman) of competitiveness of organizations. Today; the analysis of the evolution of organizations not only a problem which remains very current, but show especially all the complexity which recovers the subject of the functioning of organizations and their evolution (5). A complexity which should be seen more through the interdependence of the internal relations and those externs of companies. (6). And especially in a domain where the number of the actors is important and the interests diverge. The research for an organizational structure assuring the adaptation in context and conditions of the environment and finding the best balance between the coordination and the internal configuration; constitute the main concern of companies not only on the structural plan but also on the behavioral plan. The interaction between the external context and the internal stakes is explicitly formalized through the analysis of the processes of coordination of the activities and the relations of staff (2).

The stake becomes more and more important as soon as it is about the written information taken in a formal frame, because of the credibility and the reliability which it presents, so allowing the company to improve the conditions of visibility and transparency at the level of it reports of exchanges and it practices which are memorized in its archive conscript: history. On the way; the company succeeds in forging, throughout its history a reliable image assuring him the survival and the sustainability in the face of an uncertain and unpredictable environment (7), (8).

One has to note that this written information is nothing else than the support of what we call: traceability. Finally topical subject, it presents a strategic stake and becomes an inescapable factor for the preservation of the market shares of companies and development of customer loyalty of the commercial reports. It thus shows itself necessary for the company to set up a system of traceability which watches what there is transparency in the functioning. (2), (9).

To be agile, it is advisable that this system is organized, enhanced reliability and coherent. What can be made only by the understanding and possibly the control of the endogenous informative process which composes it, and which is going to establish, from then on, the legitimization of paradigm of the information system of the concerned organization. (10).

So; presented the information system, allows to put the history of the company in a proactive approach, to composes the optimal reactivity according to the constraints of the environment, the objective head teacher (main clause) of any system of traceability.

The scope of the traceability thus saw extending in all the aspects of the management, so contributing to the organizational suppleness. It imposes as a consequence a rigorous management which is of the transparency and the responsibility of the various actors which composes it (11).

Yet the fast transformation of the competitive environment (the fast variation of the request and the requirement more and more raised of the customer) is at the origin of a fragmentation of the processes the interoperability of which the interactions and engenders an increasing interweaving of the informative flows: they are then considered as being heterogeneous. Thus the objective is to try to master the complexity, or more exactly to make with as with waves to move forward: when she grows, the difficulty piloting the traceability increases "in an exponential way", questioning the organizational efficiency which becomes then powerless to answer the diverse needs for information and for coordination and, a fortiori, assure a reliable traceability. To face the high requirements of the competition (competitors) and the uncertainty which surrounds the processes and succeed in mastering this complexity, he(it) turns out to be necessary to conceive(design) an information system of traceability from architecture of information adapted to the analysis of the problems of coherence and the cutting(division) with the aim of improving the existing information systems. (12), (13), (14).

Indeed; the Information system, once set up, will allow to solve the dilemma which consists in arresting «the importance of the strict formalization which allows the history to be a directory of reliable solutions in the procedures. However an excess of formalism makes stiff

these procedures, what will have by consequence of pernicious effects on the flexibility and the reactivity of the company ", by putting the history in a proactive approach, making of the latter an immense useful reservoir of knowledge for the organizational action. So, we hold in this work that: the information is a strategic variable and an essential vector of coordination for the company, where from the importance and the role of information systems in the control of the traceability and the improvement of the organizational suppleness for a better competitiveness of the company. (15), (16), (17).

The implementation of a system assuring the traceability of the goods can allow the actors of the harbour supply chain to count three main processes: management of stopover of ship, control of the cold chain and the generalization of the information system, and to have information on the state of the transport by locating in real time place of the goods, to locating the schedule, the route, the speed of a means of transportation (18), (19).

All this is going only to contribute to a better control of flows leading to an optimization of the management of organizations and consequently a reassurance of the various stages of the chain of harbour logistics. At this level, the main question which calls out to(questions) us is the following one: to what extent the institution of an effective led information system has the efficiency of the management and the suppleness of organizations?

This problem justifies itself of this fact through the following axes:

- Identification of the main processes of the supply chain;
- Analysis of the various flows of information which result from the interoperability of the operations making up the identified processes;
- Analysis of the architecture of information of the processes from the determination of the classes of data created or used by the latter;
- Diagnosis of the existing information system of the organization and the identification of the processes judged as being badly informed;
- Suggestion of the solutions of improvement susceptible to lead to a design of the architecture of information bound to the harbour community.

Thus the present work has for object of: recommend, after an analysis and a diagnosis of the information system of the various speakers at the level of port of Agadir, improvements by architecture of information adapted to our ground of study

## 2. Methodology:

with the aim of answering the questions concerning our problem, we proceeded to the realization of this study, by following an approach of qualitative nature; the method the most adapted to our domain of search which is information systems, and more exactly search action which seems to be the most relevant method in the design of information systems.

By means of the guides of conversations and the questionnaires, our meetings with the logistic persons in charge and of operations of the shipowners, so the representatives of the other main participants throughout the harbour supply chain in the export; reports allowed us to generate and to make serious conclusions from the data and the meditative information. The guides of interview managed with the harbour actors public and both questionnaires (the one intended for shipping companies or their representatives, and others in chargers: exporters, forwarders, and agents) include at the same time closed questions, open questions, questions with multiple choices. These tools constituted the base of meetings deepened with the persons in charge of the actors implied in the survey. It would finally allow of account, to identify the main processes of the harbour supply chain (management of stopover of ship, control of the cold chain and the generalization of the information system), and to estimate the informative systems existing in the port and common and real dysfunctions of the harbour supply chain in the export of fruits and vegetables of origin of the region Sous Massa Draa and loading since the port of Agadir, also to make the interviewees participate to recommend adequate solutions.

Indeed, we are going to approach this article in three shutters:

The first shutter thus consists in making an analysis of the existing from the identification of the fundamental processes, then an analysis of the various flows of information which compose them, as well as the classes of data used or created to determine the architecture of the information.

The second shutter is the object of a diagnosis of the adaptability of the information systems existing from the made analysis. This diagnosis will constitute the base of the suggestions which will be the subject of the third shutter, which will have for object to propose existing solutions of improvement of the information system, susceptible to end in a conception of the architecture of the information and the traceability within the port.

## 3. Results of the study:

The port of Agadir is a compound platform of several under sets, quays in the back industrial park, interconnected by locks and internal ways, themselves connected outside in some strategic points. By its complexity, this structure gives rise to several difficulties of diverse orders.

By means of the guides of conversations, our meetings with the persons in charge and the actors of the harbour supply chain; allowed us to end in the following results:

### 3.1. Functioning of the harbour supply chain:

The follow-up from start to finish of an operation of export and especially the export of the perishable products is a service which interests all the actors of the supply chain concerned but which can be supplied by none of them (fig.1).

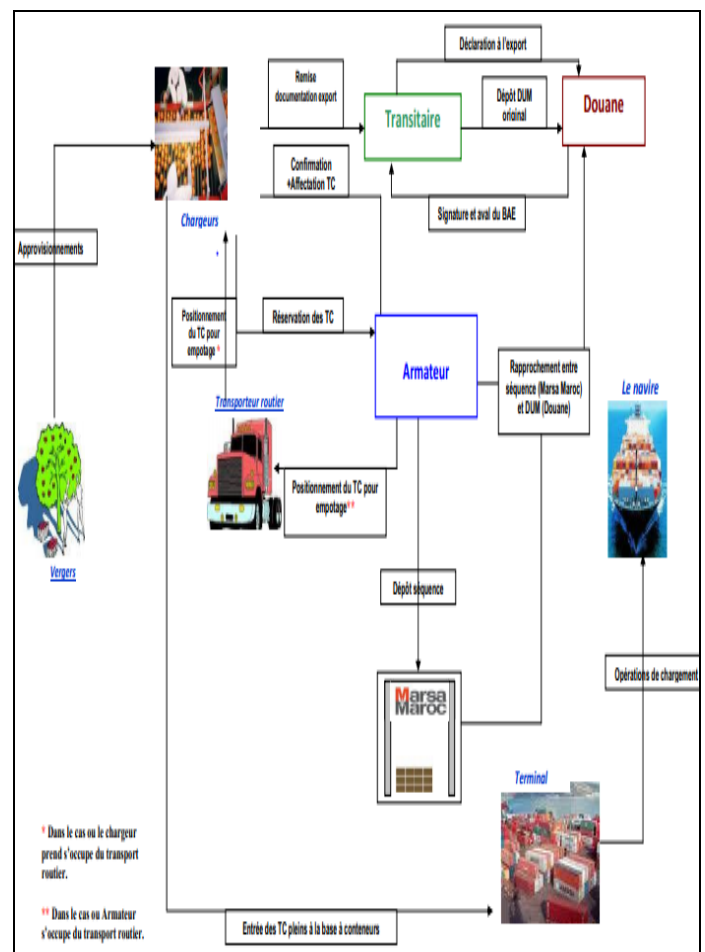


Fig -1: The actors and the functioning of the harbour supply chain

### 3-2-Main processes identified by the study

Practically three quarters of the investigated demanded the low level of reactivity of port in front of constant changes of the environment. This weaknessowed generally to the lack of the adaptability of information systems and the absence of the interconnection between the existing systems. While 24,3 % of the questioned declared that they are very satisfied, as illustrious represent it fig 2:

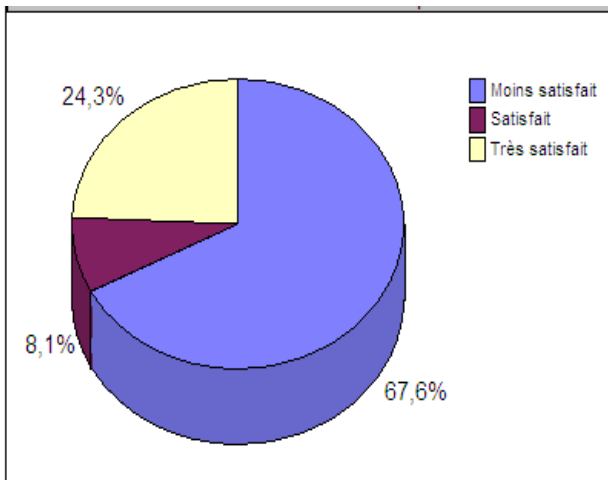


Fig. 2: Level of the reactivity of the port of Agadir

The whole investigated population is convinced that the organizational suppleness of ports crosses by the control of these main links of the supply chain harbour as shows the fig 3 below:



Fig.3: Main processes aimed in the port

#### ✓ Management of stopover of the ship

The purpose of this process is to collect the information relative to the perception of their customers compared to the

services granted to implement) the corrective, preventive actions and of improvement.

To be made, the passage by the following activities turns out to be necessary:

- Handle the complaints customers;
- Affect the problems;
- Realize the evaluations;
- Realize the audits of the services;
- Verify the calibration of the assessors;
- Verify the efficiency of the implemented action plans;
- Follow the indicators of the process;

Develop the competence according to the requirements of the customers and in association with the other speakers; Set up corrective action plans, preventive and the plans of improvements.

Indeed, these activities give rise to an outfit of the flows of the data which feed this process, called "input data", reaching various processes called "suppliers". These flows of information are transformed by an information system throughout progress of the entities of process to create output data, which are going to be sent afterward to other processes called "customers".

#### ✓ Control of the cold chain:

This process aims at defining, at communicating and at spreading a quality policy of service as well as associated, coherent objectives with the global strategy of the company.

Indeed, the activities which ensue from this ring road are as follows:

- Define the politics and the plan quality of service;
- Define the responsibilities and the authorities;
- Plan management reviews;
- Spread the politics and the plan quality service;
- Realize management reviews;
- Verify the respect and the coherence of the deployment;
- Verify the infringement of the objectives;
- Decide and implement corrective, preventive actions and improvement.

#### ✓ Generalization of information systems:

The objective of this process is double:

Assure the availability of the installations according to the requirements customers;  
Assure the maintenance of infrastructures and working environment.

This process spreads out on all the infrastructures and the installations of the structure and generates the following activities:

- Plan the interventions of maintenance and the necessary resources;
- Realize the interventions;
- Follow the indicators of the process;
- Measure and analyze differences;
- Set up corrective and preventive actions;
- Set up and liven up the plans of improvements.

Also, this process is fed by data of entered which are transformed to create new output data.

### 3-3-Diagnosis of the processes:

#### ✓ Management of stopover of the ship

The big weakness of the process of customer satisfaction lives in the absence of a database which connects the service of customer provision to the supplier, what pulls a waste of time concerning the complaints customers.

The absence of a shared database which goes back up all the defects noticed in the concerned processes.

Indeed, the only support to go to raise noticed defects is the paper base which lives in the unique list of the problems.

#### ✓ Control of the cold chain:

- The absence of a shared database which capitalizes the problems of the quality of service in a general way and allows taking out a dashboard computerized by the quality of service which will be the base of an effective decision-making and a follow-up continues of the improvement of the quality.
- The implanted information system does not integrate the model of the quality.
- The system of audit is not reliable because the action plans which ensue from audit reports are not realized in the exact time specified in the audit report.
- The key point which arranges the participants in the port is databases which play a key role in the traceability but are not interconnected.

#### ✓ Generalization of information systems:

The objective here is to increase the reactivity not to cause stops of service. However, this reactivity depends on the flexibility of the information system.

In the absence of an information system of follow-up and preventive control, the agent maintenance cannot answer

all the breakdowns of the installations and identify their causes in a minimum of time.

Generally, we observed:

- A big disparity in the exchanges between actors, as well in the contents of the data as at the level of information media;
- A lack of flexibility and organization in these multilateral relations, to see sometimes, the absence completes of information;
- One time of distribution of the information between the users abnormally long, what often returns the exploitation of this information unsuitable for needs;
- A little effective management of containers and consequently a loss of income for the interested services.

## 4. Discussion of the results:

- The development of such a solution so leading earnings of competitiveness on the whole chain and extension of the offer of the logistic persons receiving benefits will open a very wide market on the national level and world. The forward objective is to manage to implement a platform of the information linking all the participants at the level of the port.
- The requirement of reactivity in the process support of maintenance has a share, he has to focus more and more on preventive actions. Thing which can come true only by the implementation of a powerful information system of traceability which keeps the history and locates, "tracking", permanently critical points susceptible to create breakdowns, and which manages, in a optimal way, the plans of surveillance communicated by the service delivery (fig.3).

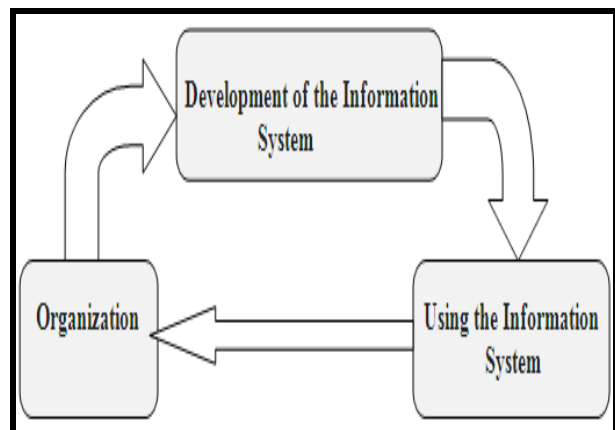


Fig.3: buckle of feedback between organization and information system

For this buckle, it will be useful to set up a system of control and follow-up of the realization of action plans. So, as the quality is a constructed, we suggest to set up an information system of traceability which will allow, via a shared database, to memorize the experience (the problems and the solutions: action plan) lived by the harbour community and to spread it in the form of dashboards of the quality of service, so indicating the level of realization of the objectives. This database must be updated and fed by the other processes with information concerning the quality.

- Finally, to return the agile and effective organization, we have to show to the actors that constitutes a system of improvement and not penalty and involves a place of cooperation to solve problems. Generally speaking, to make a success of the application of the architecture of the information representative of all the processes, we suggest of:
- Set up computing powerful tools of treatment of information, to increase the processing capacity of information; and finally to assist better the operators in their functions and by consequence, increase their yields and their reactivity faces at the needs for the clientele.
- Return the human aspect at the level of the information system, to decrease the risk of losing its implicit knowledge, and of passing on its tacit knowledge in an explicit knowledge capitalize it so in a computerized memory by recommending the Knowledge management.

So, for all the «operational processes », we suggest, to increase the flexibility and the reactivity in front of met situations, a system of feedback.

From the led analysis; The connections to be realized between the processes and the reactivity so that the coherence is assured. The architecture of information offers a model of analysis for problems of communication and coordination in the organization.

Thus, the major idea is to reveal a division in domains which minimizes the interdependences in a group of process having «profiles of use " nearby and similar, that is sharing domains constituted by a group of processes and classes of data strongly connected between them and constituted the object of a permanent evaluation fig 4).

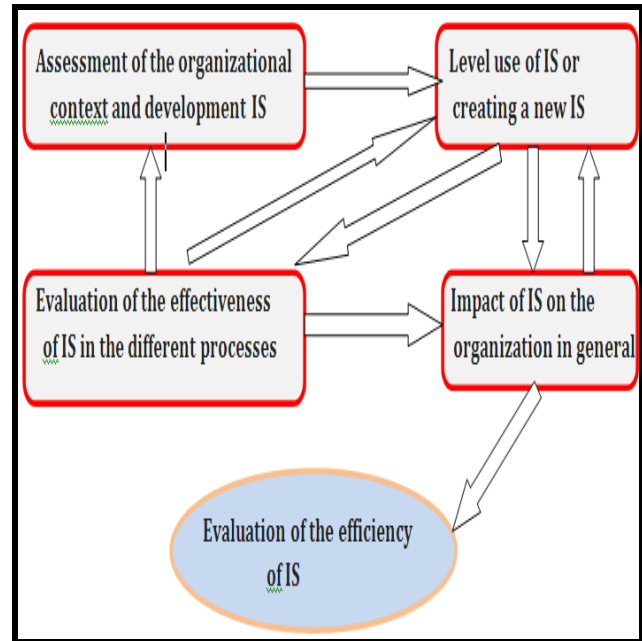


Fig 4: Approach of evaluation of information system

## 5. Conclusion

By choosing the problem of design of information systems, our work has for purpose to propose improvements of the existing system, to develop architecture of information which establishes the starting point of the design of an information system of traceability bound to the organization.

However, among four design phase applied to the information system to be known, the analysis, the design, the setting-up and the evaluation, we limited ourselves to the first two stages of the design of information systems to know the stage of analysis and that of the design.

The idea is to give to the harbour community a base of data detailed on a server concerning all the harbour movements with all the information bound to the operations export and import. The collection of data with all the holders of the information in a reliable and fast way. It will be about partnership between all the participants and the harbour authority to assure a service in complete safety and safety.

Therefore, the present work has was articulated around the development of the notion of process as level of analysis of information systems within the services criticize, to design then the architecture of the information while trying to answer the logical questions: "what", "why" and "how" exploring axes bound to the organizational suppleness of the harbour community.

## REFERENCES

- (1) T. F. Bresnahan et al., “Information Technology, Workplace Organization and the Demand for Skilled Labor: Firm-Level Evidence”, *Quarterly Journal of Economics*, Vol 117, n° 1, pp.339-376. (2002),
- (2) S. Benhamou. “Coordination process, organizational choice and environment complexity”, Mimeo. (2003).
- (3) H.F Gale. et al. “Skills, Flexible Manufacturing Technology, and Work Organization”, *Industrial Relations*, Vol 41, n 1, pp 48-78, (2002).
- (4) E. Caroli and R. Van, “Skill- Biased Organizational Change? Evidence from a Panel of British and French Establishments, *Quarterly of Journal Economics*, vol 116, n 4, pp.1449-1492, (2001).
- (5) N. Alter, “Mouvement et Dyschronies dans les Organisations”, *L’Année Sociologique*, Vol 53, n° 2, pp 489-514. (2003).
- (6) A. Desreumaux, “Nouvelles formes d’organisation et évolution de l’entreprise”, *Revue Française de Gestion*, Janvier-Février, (1996).
- (7) C. Berger, S. Guillard., “La rédaction graphique des procédures”, (2000).
- (8) C. Dejoux, “Les compétences au cœur de l’entreprise“, Ed. D’Organisation, (2001).
- (9) E. Lorenz and A. Valeyre., “Les formes d’organisation du travail dans les pays de l’Union Européenne, Document du Centre d’Etudes de l’Emploi”, n 23, juin. *Les Cahiers de l’Actif - N°292/293*, (2004).
- (10) A. Desreumaux, “Théorie des organisations“, Ed. Management et Société, (1998).
- (11) C Morley, J Hugues, B Leblanc, O Hugues, “processus métiers et systèmes d’information“, Paris. (2005)
- (12) C. Lusthaus, and al.; “Evaluation organisationnelle: démarche et techniques de description des processus”, AFNOR, Paris. (2000).
- (13) C. Lusthaus, M.-H. Adrien, G. Anderson, F.Carden., “Améliorer la performance organisationnelle– Manuel d’auto-évaluation”, CRDI, Ottawa. (1999)
- (14) Orayx. “Choix d’outils de modélisation des processus”, (2003).
- (15) Vas, “Les processus de changement organisationnel à l’épreuve des faits : une approche multi-pragmatique”, Actes de la 11ème Conférence Internationale de l’AIMS, Paris,(2002).
- (16) Rapport FUTURES GROUP. Ostriches and Eagles, URL: 6° Congrès international francophone sur la PME - Octobre (2002) - HEC – Montréal. (1997).
- (17) Rapport AFNORX50-176, “Management des processus”, AFNOR,(2000).
- (18) A. Elmenssouri, O.O. Zerouali and H.M. Hamri, “the chain of cold; lever of the competitiveness of the ports or simple link of the supply chain? Case of the port of Agadir”, *IJSET*, Vol 1, Issue 9, 2014.
- (19) O. Z. Ouariti, A. Elmenssouri and H.M. Hamri” Impact of The control of the port passage on its attractiveness: Case of the port of Agadir”, *.irjet* Vol: 02 Issue: 08, 2015

## BIOGRAPHIES

**Ouafae ZEROUALI OUARITI** is a Professor of Higher Education and responsible of the Equipe de Recherche en Economie du Transport, Technologie de l’Information et Logistique (ERETTLOG). National School of Business and Management Agadir Morocco.

**Abdellatif ELMENSSOURI** is a Doctor in Management Science and a member of the Equipe de Recherche en Economie du Transport, Technologie de l’Information et Logistique (ERETTLOG), Ecole Nationale de Commerce et de Gestion of Agadir, Morocco.

**Hicham MOHAMED HAMRI** is a Professor of Higher Education and a member of the Equipe de Recherche en Economie du Transport, Technologie de l’Information et Logistique (ERETTLOG). National School of Business and Management Agadir Morocco.