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Qualigility at the service of public health: case of dispensing drugs in a hospital pharmacy in Morocco

Abderrahmane Moussaid
Economic Science Department Hassan II University, Faculty of Law and Economics Casablanca, Morocco.

Abstract— In today's economic situation, there are various competitive constraints and regulations which are imposed on the health facilities, especially hospitals. It needs to demonstrate their flexibility and responsiveness in order to maintain or improve their competitiveness and performance levels. It is necessary to constantly reflect on an organizational and managerial level. Therefore, our work aims, through abductive approach, to emphasize the need to adopt the hybrid management organizational concept called "Qualigile" applied to the dispensing of drugs in hospitals' pharmacies. It presents a new method of improving performance, nascent of the combination of classical methods of quality and agile methods. This approach aims to maximize the net creation of value and sustained profitable gains, thanks to the quality management system, the agility of processes and the speed of service to competitors, through innovation, efficiency and responsiveness, by a force of the human factor through values, skills and a collective intelligence, and finally by a continuous prospective vision.

Keywords: Qualigility, Agile Thinking, Quality Management System, agile methods, Lean Management and hospital pharmacy.

I. INTRODUCTION

Since 2008, the global economy has been in an acute crisis. Most economic sectors have been seriously affected. The same for health sector; It has witnessed important changes, particularly in Supply Chain Management (SCM) [5]. It has faced great challenges in managing limited resources that are shrinking dramatically in the face of growing demand [8]. Thus, this sector should find new concepts and approaches to improve its quality of service and increase its responsiveness to face unexpected events while reducing costs. A thorough study is essential to enable this sector to better adapt to new economic requirements. This is why we are focusing on this research on the optimization of logistics flows related to the dispensing of drugs in a hospital pharmacy (HP) by allowing public hospitals to better position themselves on the market thanks to the «Qualigility» concept combining the Quality Management System and the agile concept. The qualigile approach is essentially based on a total quality system, with the philosophy of Kaizen and accompanied by good practices of driving change. It aims to improve the performance of organizations and the quality strength fields associated with the different agility components that are the communication, work organization, human wealth, problem-solving ability, innovation, conviviality and control of the ecosystem. Due to the existence of these two categories, classic quality on one side and agility / lean on the other, what would be the symbiosis of these two concepts? A symbiosis that could give a new neologism: « qualigility » or « qualilean ». Especially, what would be the gains recorded by the hospitals that would be involved?

This paper aims to study the feasibility of this hybrid concept "Qualigile" in the field of health and measure the level of engagement of public hospitals in Morocco towards this approach. It is about providing arguments to debate "qualigile" concept, an emerging instrument currently in full development, oriented to reassure the quality of products and services, improving competitiveness, through the provision of information and communication technology applied in the health sector. Our first goal will be about defining "Qualigility" and bringing together various contributions to understand the characteristics of the qualigile organism and the dimensions that characterize it. We will describe in a second aim the level of applicability of this concept in a hospital pharmacy and we will expose the results obtained from a qualitative study applied to a Moroccan public hospital.

II. LITTERATURE REVIEW

Certainly, there are rich and numerous researches about the management of the supply chain in a general way as well as the management practices promoting a competitive advantage and reducing costs. However, the health sector has been extremely slow in adopting these practices [11]. The application of Supply Chain Management (SCM) to patient flows in the health sector is more complex than in other sectors. What led SCM practices not to be adopted? McKone-Sweet et al. (2005) reveals that there are many other barriers which prevent the adoption of SCM practices, including lack of executive support and limited training in the field of

SCM. This lack of adoption is surprisingly giving that 30 to 40% of hospital expenses are invested in logistics activities. In addition, almost half of the costs associated with supply chain processes could be eliminated using the best practices of the supply chain [15]. Although there are initiatives in health care, there is still a lack of academic research at the SCM in the health field [21]. This is a gap that this article attempts to complete by introducing and applying well-known concepts rarely studied in the field of health care, namely the « qualigile » concept.

A. Agile concept

Organizational agility appears as the ability of an organization to respond with flexibility and responsiveness to the various fluctuations of its environment and to offer services and products of quality corresponding to the requirements of its customers. It integrates two main notions namely: responsiveness and flexibility [18]. First, flexibility measures the ability of an organization to adjust to a given level of production using the same technology. Then, it corresponds to the number of future alternatives, subsequent to a given decision [4]. Second, responsiveness refers to the reaction time to an unexpected evolution. In other words, it is the speed at which an organization can respond to the changing demands of its customers, including those which are not anticipated [19]. Moreover, agility was not widely discussed in the literature in the field of health. It was initially developed in the field of software in 2001, before being extended in very different fields such as aeronautics, aerospace, food distribution, travel… [16]. It has introduced new project management methodologies [22] called «agiles» methods which are more flexible and able to overcome rigidity of classical quality processes, with a significant consideration of user needs. They make it possible to avoid the wasted time of unnecessary developments to concentrate on the real needs of the customers, and their evolutions during the project.

B. Qualigility process

Qualigility is the process which aims to improve the performance of organizations, the force fields of quality coming to channel the different aspects of agility, i.e. communication, work organization (or collaboration), human richness, problem solving ability, innovation, conviviality, efficiency and ecosystem control [6]. It is about applying the requirements of the standard to the context of the business. It is necessary to understand the novelties and concepts of ISO 9001 version 2015 and to determine the best practices to master them correctly. For this, the bibliographic vigilance is a good way to benchmark. Feedback experts and consultant advice have given us a better view on the adoption of ISO 9001: 2015 and good practices to avoid risks and seize opportunities.

C. SCOR/Six Sigma/Lean/Qualigility Convergence

Combining the three methodologies SCOR/Six Sigma/Lean Manufacturing makes the improvement of efforts more efficient [14]. Furthermore, Qualigility enhances competitiveness and promotes better performances [12]. The most advanced users of the model SCOR (Supply Chain Operations Reference) are currently focused on this convergence which gives them a better profitability of their Supply Chain. The gains from this convergence are three to five times higher than the investments [14]. The SCOR dashboard contains standard performance indicators which are hierarchical in several levels so that lower level indicators can be used to calculate top-level indicators. These indicators are divided into five performance areas which are: reliability: delivery performance; responsiveness: order fulfillment time; flexibility: flexibility to order variations; Logistics costs: Logistics costs and products sold and Asset Management: Financial Flows and Working Capital [10]. SCOR methodology structures alignment of operations on indicators and strategic objectives and identifies opportunities for improving profitability. Six Sigma methodologies help diagnose and reduce process variations. It is based on the realization of five stages that contract in DMAIC: to Define, Measure, Analyze, Improve and Control. Each step has different tools that are grouped in a coherent approach. As for Lean, it is an evolution of waste elimination and process rationalization techniques developed within the Just in Time framework. Its principle is to realize "only what is needed, when it is necessary, in the exact quantity, with the minimum of resources". The SCOR model is, therefore, a very good tool that can be integrated into the implementation of Six Sigma and Lean approaches [14]. Overall, the weaknesses of each methodology are filled by the combined implementation of the three approaches. Without a doubt, the Supply Chain tends towards the excellence expected by the market and the shareholders [14].

D. The dispensing of drugs

1. Functional organization of hospital pharmacy

The Hospital Pharmacy (HP) is a structure within the hospital whose missions are derived from the general purpose and define the policy of the hospital [20]. The missions of a PH may vary from one country to another, from one region to another in the same country, but having the same common denominator is the

availability of pharmaceuticals products to the hospital. In France, one of the main tasks of the HP is the management, supply, preparation, control, detention and dispensing of drugs [9]. The PHs are responsible for ensuring the availability within Public Hospital Establishments (PHE) drugs, materials and medicals devices, which are essential for the care of hospitalized patients, patients suffering from a social illness and followed by a hospital service and patients admitted in emergency [17]. In addition, the hospital pharmacist is responsible for ensuring, in collaboration with the staff of the hospital services, a pharmaceutical service focused on availability, safety, quality and affordability for patients. Its main mission can be defined as the implementation of a general organization of the services delivered by the pharmacy by optimizing the technical and administrative activities of the service, allowing meeting the patient's care goals, institutional orientations, and the optimal management of the available resources.

2. Structural organization of hospital pharmacy

The structure of an organization can be defined as the total of the means used to divide the work into separate tasks and then to ensure the necessary coordination between these tasks [20]. Each HP has its own organization. However, the basic structure usually includes: the functional organization, which corresponds to the procedures of implementation for the accomplishment of the missions and the administrative and technical organizations, which correspond to the procedures for carrying out the tasks.

Moreover, a PH consists of a set of elements which are essential its proper functioning. There are usually five basic units: 1. the operational center where its elements are responsible for the production of the "pharmaceutical service". It includes pharmacists' preparers, interns in pharmacy, and even the pharmacists themselves, especially when a part of their functions is focused on services (Prescription analysis, parenteral nutrition…). 2. The strategic summit where he is represented by the pharmacist department head. He organizes the work of his service, defines goals and manages relationships between the pharmacy, other services (care units, administrative and financial services …) and suppliers. 3. the hierarchical line where it can be composed of the functional class preparer who is responsible for all the aids, storekeepers and other preparers; of the pharmacy assistant, responsible for the work of the operators (pharmacy preparers, interns, fifth-year university hospital students, external) of a given sector, for example that of the drug or material; and of the assistant pharmacist to the department head. 4. The techno structure where it ensures the design, the operator work planning and training. These functions can be provided by pharmacists themselves or by pharmacy interns. These are: writing good practices relating to manufacturing, dispensing and delivery; training of pharmacy staff and supervision of pharmacy students and para-pharmaceutical students. And finally, 5. Logistical support, an element which outside the workflow, has for mission to favor the work of the operators. These are accounting, research and development, secretarial and computer services [20].

III. EPISTEMOLOGICAL ORIENTATION AND METHODOLOGY OF RESEARCH / HYPOTHESES

Through an abductive approach, our work aims to propose a new vision in the field of organizational qualigility at the dispensing level of drugs within the hospital pharmacy, relying on the advantages which are offered by the two concepts: quality and agility. Sections A, B and C summarized some relevant documents in order to clearly position our current contribution. Abduction (or adduction) consists of drawing from the observation conjectures that should then be tested and discussed [7]. Thus, the first phase was devoted to a theoretical orientation resulting from the elaboration of a synthesis, research carried out, supplemented by an exploratory study through interview guides and observations to identify good practices promoting adequate organizational and functional structures for their proper functioning. Thus, the search for theories adapted to an empirical observation, called "corresponding theory", or "systematic combination" [7]. This search begins with an attempt to find a new corresponding model [2]. The purpose of this process is to understand this new phenomenon [1]. In the second stage, real-life observations through case studies are then used to explore how hospital pharmacies apply the concept of qualigility and to what extent this concept can be used in public health, particularly in the case of dispensing drugs, thanks to the verification of the following hypothesis: By successfully adopting the Qualigile concept, pharmacies in public hospitals are able to fully meet the needs and requirements of services in terms of dispensing drugs.

Thus, an interview guide was sent to health staff working in a Moroccan public hospital. The subjects of the survey are doctors, surgeons, pharmacists and nursing staff who constitute our unit of analysis. This interview guide was based on the following criteria: the context of the organism; the actions to be implemented in the face of risks and opportunities; communication and performance evaluation. The advantage of this prioritization is to be able to lead to improvements on other criteria. This is the case expected for the following criteria: leadership; change planning; managing documented information and carrying out operational activities.

IV. RESULTS AND DISCUSSIONS

A. The analysis results of the survey

The results of the data, resulting from the survey, are shown schematically in the diagram of fig.1. They allow evaluating QMS very precisely according to all the requirements of the standard. It also helps to identify any areas for improvement and give a precise level of conformity on each criteria of the standard.

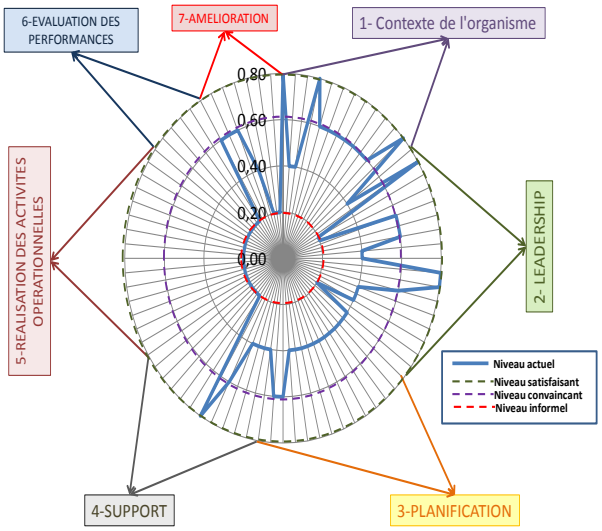

Fig. 1. The results of analysis of the needs and requirements of the services of the hospitals

The QMS of the current situation of the public hospital, object of the study, has registered a level of conformity below than 60%. This difference is recorded, in part, in the following criteria: (§1) context of the organism; (§2) Leadership and (§4) Support. Otherwise, a more visible delay is displayed globally at the level of conformity of the following criteria: (§3) Planning; (§5) Carrying out operational activities; (§6) Communication and performance evaluation and (§7) improvement.

Indeed, during the first phase, at the level of the context of the organism, the information related to fixed challenges, the responsibility of each contributor, and the process related to dispensing drugs, are not well identified and monitored. Similarly, for the leadership component, the hospital management lacks engagement to sensitize, involve all staff, identify and integrate client requirements into the drug dispensing process. During the second phase, on the planning side, risks and opportunities related to dispensing drugs are poorly determined and quality objectives related to this process do not take into account customer requirements and finally, the hospital management does not take the necessary and sufficient measures to ensure the availability of the necessary resources for the QMS. Furthermore, at the level of the support, the hospital management did not make any effort to identify the necessary skills and program the training needs of staff whose work affects the quality of the product at the level of dispensing drugs. As for the third phase, concerning the implementation of operational activities, the results are below than expectations. Indeed, the hospital, object of the study, does not have enough means nor well defined processes to verify that products or services related to the dispensing of drugs meet the requirements of clients. It also suffers from the lack of control of its monitoring and measurement activities related to the dispensing of drugs. Finally, during the fourth phase, from the point of view of evaluation of performances, no action is taken by the hospital to evaluate and monitor customer perception on the level of satisfaction of their needs in terms of dispensing drugs. It should be noted that audit criteria and scope of action are not well defined and the auditors remain less impartial to carry out their missions objectively on the audited process. Also it should be noted that no documented procedure has been written to formalize the actions that identify the causes and the corrective actions related to drugs dispensing. In addition to the previous analysis, the results' interpretation, shown schematically in the diagram in fig.2, are from the survey based on the same criteria but according to the three components: 1- Global vision capability, 2- Ability to question and 3- Agility.

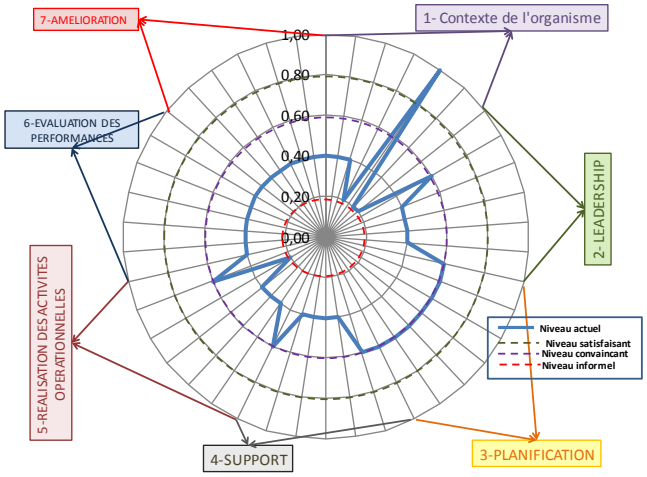

Fig. 2. Les résultats d'analyse d'application de qualigilité

Thus, the level of application of qualigility within the public hospital, in our case of study, also recorded a level of conformity below than 60%, especially during the second and third phases.

During the first phase, qualigility's application is still far from understanding the context of the organism (less than or equal to 40%) with zero agility margin because of the absence of autonomy and responsiveness of employees, with the exception of a great will to lead change by the hospital to establish ISO quality though this has the ability to bring about radical changes both at the organizational level and at the process level on dispensing drugs. As for the application of qualigility at the leadership level, if an effort has been made to mobilize employees in the management of resources on dispensing drugs, responsibilities and redistributions of responsibilities are poorly managed at organizational levels related to dispensing drugs to achieve the objectives in quality. Regarding the second phase, application of qualigility, on the planning, reaches a convincing level for its three components: Global vision capability, Ability to question and Agility. However, this level of application of qualigility, it varies from 40% to 60% about support. Indeed, if the management of the hospital managed to keep, communicate and update information related to dispensing drugs, it does not give much importance to the training component and employee awareness, and especially it cannot effectively simplify quality procedures and documented information related to dispensing drugs. As for the third phase, failures recorded in the achievement of operational activities, especially at the level of change management, because of the absence of the work teams, versatile intended to work in project mode. However, the hospital has a satisfactory margin of agility thanks to the management's attention to suggestions from subordinates and collaborators for a possible process improvement related to dispensing drugs. Finally, concerning the fourth phase, application of qualigility is below expectations (less than or equal to 40%) both in terms of performance evaluation and improvement level for the three components. On the side of agility, the hospital did not put effective devices to evaluate the engagement of the staff at the level of change management and promote self-control to have a large margin of agility related to dispensing drugs.

B. Recommandations

In this paragraph, we will try to propose to HP a set of tracks to follow, based on the resulted obtained from our study. It is not about proposing a "turnkey" approach, but rather a guide which groups a set of concrete action plans, which could be set up. According to the survey carried out at the Moroccan public hospital, it turns out that this hospital does not yet have a Quality Management System (QMS) according to ISO 9001. This certification could allow this hospital to be structured according to the process approach. The description of activities as a process often reduces the complexity of the situation and causes a concern for coherence [14]. In addition, AFNOR has published the first FD X50-819 guide, in July 2011, about the synergy between Lean Management and ISO 9001 which will help organizations in their improvement initiatives. The complementarities between the contributions of Lean and those of ISO 9001 would make the process approach more pragmatic and to favor the adhesion of the operational. Thanks to the contribution of Lean in flow management, processes could be managed more productively, fluid and agile by encouraging employees' participation of all organizational levels [14]. These complementarities also offer a better opportunity for monitoring operational activities through the visual sharing of results and promotes consensus to create group dynamism (Fig.2).

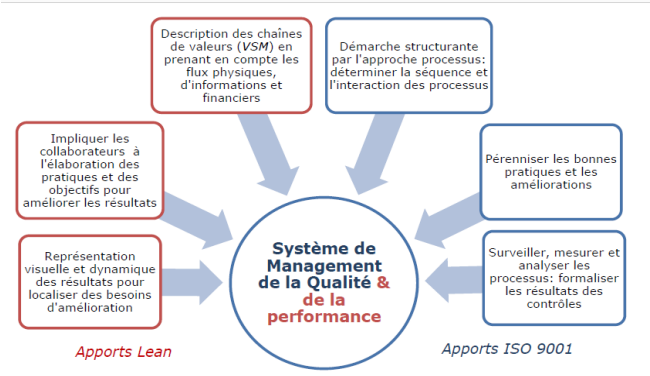

Fig. 3. The synergy of lean management and ISO 9001 according to FD X50-819 [3]

Lean progress is based on mastering "work standards" and the active involvement of operational staff in identifying and correcting nonconformities at the most upstream possible level of process, whereas, the ISO 9001 standard requires the establishment of appropriated dispositions. It must be more rigorous rather to cover nonconformities, relatively consistent. In addition, the hospital has the interest to further improve its relations with its ecosystems and solve the difficulties in internal communication, reserving every morning quick information meetings to have a feed back on the progress of the various projects and fix or remember the future objectives. Similarly, it is highly recommended to integrate good practices of quality management in an agile way to the daily activities of the hospital to have more performance and get the certification as a natural consequence of a good management system. The following are highly recommended:

- Take into account the suggestions of the operators, especially those of nursing majors to have the desired drugs at the right time, with the engagement of doctors to express needs in collaboration with pharmacists in order to have visibility on the drugs available in the stores thanks to a reliable and efficient information system. The continuous improvement system could, therefore, only be effective if there is a synergy of engagement from the operational level to the management, including that of support services which is often neglected [2].
- Involve all interested parties (doctors, nurses, pharmacists, operators etc.) not to lead to an extension of time, especially when exchanging information or expression of needs and therefore to customer dissatisfaction [2].
- Ensure that the information system established to ensure fluidity and connectivity between the pharmacy, the direction, and the various services, is strictly respected then improved by actions kaizen type [2].
- Invest more on the preparation by mobilizing all concerned contributors to manage the right change and take into consideration the complexity of the situation. For example, the establishment of automatic distribution cupboards of drugs in an emergency service. However, this type of change in the procedure requires a consensus of all contributors.
- Evaluate in detail the activities included in the scope of application of the QMS, through internal audit and VSM, to identify malfunctions as well as possible suggestions for solution.
- Follow closely the achievement of actions and the evaluation of the results obtained relative to the fixed results. Support from direction is required to help master the newly actions done.

V. CONCLUSIONS

In sum, the "Qualigility" overall approach ensures that improvements contributed to pharmaceutical flows take into account the patient flow and the different contributors of the hospital. The quality is a guarantee of stability and robustness. Agility ensures innovation and flexibility and largely engages the staff. This combination favored a better performance of the organization. Today, the age of technology is transforming the world. New values are needed, like that of interconnection, transparency, fluidity and agility and accelerate the speed of change. Knowing how to adapt or even innovate has becomes a necessity in organizations to maintain their competitiveness and meet new challenges. Hospitals of the 21st century need more flexible management models to fit for change.

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