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Dual 2RM (Risk Minimization-Richness Maximization) Approach For An Oriented Continuous Improvement Healthcare Performance and Governance

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Abstract: Our study aims to improve the efficiency of moderate integrated management systems in the Moroccan health sector for public or private organizations. Our analytical approach is based on a new dual 2RM (Risk Minimization and Richness Maximization) as a guiding vector, allowing the implementation of an oriented continuous improvement toward the governance and sustainable performance of the sector. Admittedly, good management of information flows is necessary for making a good decision, especially in the health sector impacted by the health crisis of covid 19, which plays a fundamental role in economic, security and social life. Several methodologies, such as SMED, QRQC and 5S, which derive from the Toyota Production System School, are introduced in this study. Thus, we propose processes and a dynamic algorithm to follow and achieve the objectives of these methodologies and ensure a high level of performance and quality of health services.
These processes and algorithms are based on the collection of information allowing the exploration of the type of anomaly and malfunction, followed by using a user's guide for the oriented continuous improvement by calculating indexes proposed in this article according to the dual approach. Using this user's guide allows the management of public or private health establishments to avoid the redundancy of errors and to consolidate performance towards optimizing the overall quality of service and profitability.

Keywords: 2RM dual approach; Oriented Continuous Improvement; Integrated management and information systems; Health sector; Governance; Performance; Quality.

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1. Introduction

Indeed, the state's role, among others, is to provide health services for the benefit of its citizens, in parallel with the lucrative efforts of private organizations. Such a service must be of outstanding quality

and satisfactory for social stability and adequate economic development through well-designed actions while minimizing risk and maximizing benefits.

Thus, the duality of "Risk" and "Profit-Richness" requires a high level of design by the leaders to achieve the set objectives. This shows the bilateral dimension of the "Management" function, which requires the implementation of a process of continuous improvement based on an integrated management system well adapted to the needs and requirements of the citizens/customers while deploying the necessary means at the technical level and the level of human resources competences in a rational, optimal and intelligent way.

The established work addressing the risk management issue is widely available in the literature on this subject. However, the treatment and study of the simultaneous management of Risk and Richness is minimal.

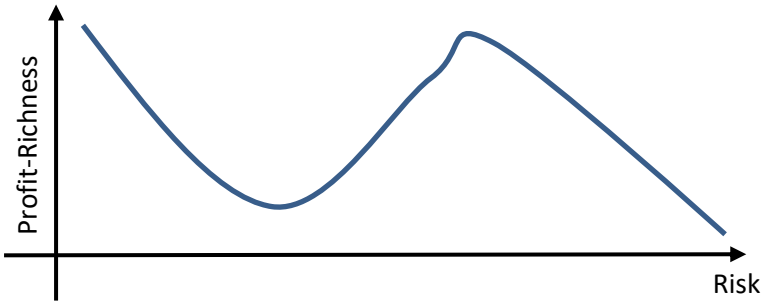

Figure 1. The Risk/ Richness interactional fluctuation

It is an interactional management between two dual factors, "Risk" and " Richness," which interact in a mutual and inversely proportional way in the managerial outcome of an organization in general and a health organization in particular.

Such an interaction can be controlled beneficially by correctly introducing the factors of oriented continuous improvement according to the dual approach to convert risk into Richness.

The problem to be treated is as follows:

a. Under the duality aspect, what is the kind of adapted process that mutually allows the control of the interactional fluctuation of "Risk" and the sustainability of the creation of "Richness," which means the fulfillment of the citizens and/or the profit for a private organization, by an oriented continuous improvement that can convert a Risk into Richness? (See fig1)

b. How can a specific integrated management and information system be set up for Morocco's health sector to ensure such interaction dynamically and efficiently?

c. How can we take advantage of the evolution of new information technology and artificial intelligence in the implementation of a model of these processes that allows the speed detection of anomalies and needs that converge towards the two dual aims of 2RM: Minimum Risk and/or Maximum Richness, especially in the health sector?

In this context, the new development model recently adopted in Morocco has clearly emphasized the importance of digital infrastructure and the new information technology NICT. This is an essential lever for increasing the competitiveness of the national economy and the performance of public and private organizations to achieve a considerable degree of social security and suitable growth of a robust, competitive and inclusive economy. In another way, this can achieve a quality service in the health sector, which has long suffered from several structural and organizational handicaps.

The governmental steps aim at restructuring this sector in order to avoid these handicaps and to facilitate access to medical services through the proposal of draft framework laws that help to effectively address the operational and functional issues of the Moroccan health system. The essential elements of the

reforms targeted by these framework bills are the upgrading of hospitals, the rehabilitation of health structures and the qualification of human resources.

Therefore, The Moroccan government is faced with a challenge to be met efficiently and optimally. The implementation of an adequate integrated management system for the benefit of the Moroccan public or private health service requires a good strategy of governance and intervention at the global level, and the basic level, the level of government policy and the level of management of local health entities within which the effectiveness of the MIS implemented is examined.

In fact, within each local health entity of different sizes, the results are to be evaluated permanently to measure the degree of efficiency and the level of quality and performance to explore whether the strategic objectives are achieved (Flaviu Moldave, 2021).

The interactions of the "Objective" and the "Realized" will be accompanied by the simulation of the SMI correctly implemented through the simulation of a dynamic algorithm. The elements of an SMI studied by several authors and actors in the field of quality management generally represent the identification of the "Inputs" and "Outputs" of the environment of the activities and operations under consideration, which are the government policies, the tools and skills made available (input), as well as the results represented by the degree of quality of service implemented for the benefit of citizens and customers (output).

In this context, our study will focus on the proposal of a dynamic algorithm for oriented continuous improvement to implement an integrated management system related to the dual 2RM concept as a measure of the performance of public and private health organizations summarized by the governmental strategic goals and by the expectations and requirements of citizens and customers. The elements of this algorithm constitute a joint process formed by a number of the adapted SMED methodology that aims to minimize the outstanding weights, the 5S methodology that ensures a high-quality operating and production environment and the QRQC methodology that allows for the rapid detection of risks, anomalies and causes of citizen and customer complaints.

This methodology also aims at the non-redundancy of the corrected anomalies and prevents the recurrence of already solved problems in the future (Bogusz Mikuła, 2018).

Such detection can be measured using many indexes, which we propose in this paper.

2. Basic conceptuel notions :

2.1 The Integrated Management System's place in the organization:

The Integrated Management System can be defined as an integrated management system that enables an organization to manage all its activities in terms of quality, environment, health and safety at work (J. Fresner, 2004). It may involve the use of specific management standards and benchmarks, such as ISO 9001, ISO 14001, ISO 45001, and may vary according to the needs and objectives of the organization.

The implementation of Integrated Management Systems (IMS) has become a prerequisite for any organization seeking to transform into a competitive and more sustainable business. (Muhammad Ikram, 2020) Thus, this system enables an organization to effectively coordinate and manage its various policies, processes, and activities to achieve its objectives. It aims to create a culture of organizational excellence by integrating the different aspects of the organization's management in a coherent manner and ensuring that the organization's policies and practices are aligned with its strategic objectives. It also assists managers in effectively managing risks and enhancing communication and collaboration among various stakeholders and partners.

In general, an organization needs to ensure its three strategic objectives: sustainability, competitiveness and development through some practical management actions and techniques rationally and optimally, which is valid for both public and private organizations, although some constraints make a difference,

mainly in terms of sustainability and competitiveness. Thus, sustainability for a public organization means the loyalty of the citizenry and the trust in the state and in the public administration that can guarantee stability and social security, which are an essential basis for the country's economic attractiveness. Its competitiveness can be explained on the one hand by competing organizations, which allows for a broadening and diversity of health services offered to citizens, especially in the case of a mega health crisis such as the recent Covid-19 health crisis, and on the other hand concerning the equivalent services existing in other developed or emerging countries that ensure a quality service for citizens and foreigners, whether resident or visiting.

However, according to (Tine H. Jørgensen, 2006), to establish competitive advantages for the benefit of the organization and promote sustainable development, an expansion of the integrated management system is necessary. This involves integrating the entire product chain as well as all stakeholders,

According to (S.X. Zenga, 2011), implementing an Integrated Management System (IMS) yields significant benefits. These include streamlining the certification process, reducing management costs, minimizing paperwork, simplifying internal management processes, and facilitating continuous improvement.

The QSE approach allows the company to obtain continuous improvement in its performance through well-managed processes, to take charge of the motivational aspects of employees, to manage the management of employee safety, and to supervise the impacts on the environment (Alexandra Simon, 2012).

It is therefore necessary to ensure reliable and efficient support for the activities of its organizations in their internal and external environments. This requires good management of information flows, resources and decisions!

Several studies have been conducted on this topic and its importance for any organization. However, one guiding factor in implementing an integrated management system is the framework. Such a framework is usually linked to international quality, safety and environmental standards. This facilitates the design and application of the IMS adapted and suitable to the specificities of the organization concerned (Alexandra Simon, 2012).

As highlighted earlier, integrating the 5S methodology into an integrated management system remarkably enhances the performance and quality of the decision-making process, guided by a meticulous mapping of the steps required in both physical and ethical actions. This integration minimizes the risk of errors while ensuring a lucid overview of the entire workspace (Rod Gapp, 2008). Although the initial applications of the Japanese 5S methodology were predominantly in the industrial sector, the growing demand for quality management and production has broadened its scope, extending its application into both production and service sectors. Furthermore, research indicates the effectiveness of incorporating various methods and techniques into the SMED methodology (Iris Bento da Silva, 2019). The 5S methodology represents a continuous improvement tool, it encompasses five key operations: sort, set in order, shine, standardize, and sustain. The implementation of 5S not only fosters teamwork but also optimizes the organization and efficiency of workstations or departments by instigating a shift in management styles (Bertholey F, 2009).

Thus, we can find some studies that address the reasons for the shift from a separate management system of quality, safety and environmental systems to integrated management through the analogy in the implementation approaches of the three standards ISO 9000, ISO 14000 and OHSAS 18000, the use of the same performance improvements tools such as PDCA, the need to eliminate problems at the source and the conduct of auditing present at the level of the three systems (Badr Dakkak Y. C., 2012).

In the healthcare sector, IMS (Integrated Management Systems) are increasingly used to improve the quality of care, reduce risks to patients and healthcare professionals, promote workplace safety, reduce the environmental impact of healthcare activities, and improve the energy performance of healthcare

facilities (Sabella Anton Robert, 2014). These systems can also help public healthcare organizations to better manage their resources and improve operational efficiency.

Implementing strategic mapping and dashboarding within an organization, in alignment with its capabilities and limitations, requires the deployment of an integrated management system.

This approach is in high demand in the healthcare sector, due to the specific characteristics of this system (Quality, Safety and Environment), which show a strong fit with this sector, known for its significant correlation with the vulnerability of its environment and its environmental specificity (vulnerability of patients, significant risks linked to medical actions and the high fluctuation of their flow).

In this sense, it is important to remember that integration is the pathway for establishing and strengthening the links between two or more core processes, in order to derive a single process that adequately combines the preceding processes, while ensuring solid coherence in the operation of its sub-processes (Badr Dakkak A. R., 2016).

2.2 Efficient management of information systems and the performance of an organization:

Since the beginning of the 1980s, inter-organizational information systems have been seen as a lever enabling companies to consolidate their advantage in terms of tactical and strategic objectives. Their field of action is no longer limited to the processes of the internal environment but also perforates the activities of the processes that interact with the different actors of the external environment. They allow, thus, the control of the strengths and weaknesses of each process according to a permanent follow-up employing dynamic cartography that gathers the whole of its processes.

In the same way and according to the quality policy established by the management process, the integrated information system shows the degree of attainment of such quality. It ensures the objective of the company's competitiveness in general (Buteau, 1988). For a public organization, this system allows the passage toward the objective of sustainable development. It assumes then that it is about a necessity assured by such a system, which became essential for all types of organizations which aims at the realization of extraordinary performance towards a perspective of innovation (Bernasconi, 1996).

Nonetheless, for managers, this is not a straightforward task; rather, it demands a grasp and proficiency in the fundamental mechanisms of information systems. It necessitates the adept integration of these systems into the organizational structure and a comprehension of their interaction with modes of enhancement directed towards achieving improved performance (Kenneth Laudon, 2010).

The management of information systems (IS) is a critical element of the performance of an organization, as it allows for the effective management of data and information technology to achieve the organization's objectives.

Some examples of how good “IS” management can contribute to an organization's performance include:

- Improving the quality and efficiency of the organization's processes: “IS” can be used to automate and streamline business processes, reducing errors and lateness and improving the quality of the organization's products and services.
- Enhanced organizational competitiveness: Effective use of “IS” can help the organization be more agile and respond quickly to market changes.
- Improved collaboration and communication: “IS” can facilitate communication and collaboration within the organization, leading to improved team effectiveness and quality of work.
- Risk management: Good “IS” management can help the organization identify and manage IT-related risks, such as service interruptions or data security breaches.

It can be said that the implementation of an information system as a support element in the process approach of a company or a public organization represents a stepping stone for managers between the requirements and the satisfaction of customers or stakeholders to avoid mistakes and optimize efforts

by choosing in a complicated way the reliable elements of this information system. Moreover, such systems must allow for the recording of indicators, which seem to be pillars of performance measurement (Virginie GALDEMAR, 2012).

3. The health situation in Morocco:

3.1 The Moroccan health sector and the Covid'19 crisis

The health crisis caused by COVID-19 has highlighted the critical importance of health security in Morocco and worldwide. Health security directly or indirectly impacts other sectors, making it essential to integrate Moroccan public and private health into upgrading and reform efforts to ensure that health organizations can cope with similar situations in the future.

According to (Frimousse & Peretti, 2020) the context of containment linked to the Covid-19 crisis prompts us to rethink our relationship with structural problems. The measures taken as a matter of urgency reflect a collective and judicious determination to face up to the situation.

Therefore, it is essential to examine the integration of health management systems in Morocco to determine the strengths and weaknesses of these systems and find ways to improve them. To achieve such development, health organizations must also improve the skills of their employees and strengthen their management practices, both technically and in terms of know-how. This can include training employees on new health technologies and practices and improving internal management processes for greater efficiency.

Regrettably, variations exist among public, semi-public, and private health organizations in Morocco concerning their dedication to implementing integrated management systems. This divergence may stem from differences in the governance structure, as well as the financial and managerial capabilities of these organizations to effectively handle health-related risks.

Nevertheless, in light of the potential repercussions of irregularities in public health services, it becomes evident that sustaining the stability of the health service is crucial, irrespective of the challenges encountered. Sustainability in the public sector relies significantly on citizen trust and stability, especially given that competitiveness entails providing diverse and crucial healthcare services, particularly during crises such as the recent Covid-19 pandemic (Cantero, 2021).This is imperative because the health sector is inherently interconnected with other sectors, emphasizing the need to uphold its stability despite external challenges.

3.2 History and regulation of the health sector in Morocco

Since the beginning of the 20th century, Morocco has undertaken a series of reforms and modernization of health services to improve health care and health systems. However, in a succession of sanitary crises and pandemics, and to delimit the damages and risks, the protectoral and then national public authorities have started to set up reforms of the health system at the level of reinforcement of the care capacity and hospital logistics on the one hand, and at the level of the nature of sector management on the other hand.

Since its independence, Morocco has made continuous efforts to strengthen its health infrastructure. In 1960, 394 primary healthcare facilities rose to more than 1980 units in a few decades. The establishment ratio per 10 000 inhabitants rose from 0.58 in 1980 to 0.71 in 1998, which means 1 establishment per 14 000 inhabitants instead of 1 establishment per 17 000 inhabitants.

More recently and in 2018, the ratio is around 3.5 per 10,000 inhabitants, one establishment per 3 000 inhabitants, with the availability of 8 442 general practitioners and 14 932 specialists, both in the public and private sectors.

Such progress and improvement of health service in Morocco resulted from several conferences and national assizes organized by the Ministry of Health to evaluate the evolution of the quality of health service and the difficulties encountered.

Thus, Morocco has undertaken essential reforms in the health system, allowing citizens coverage and health insurance, including primary care services and hospital care, low and long term. This has put a lot of pressure on the public and private health systems. Such pressure usually leads to anomalies and dysfunctions that may be irrevocable. Morocco has implemented national and international programs to improve these anomalies and facilitate access to health care with less risk, more quality of care, and efficiency of health systems.

To ensure the sustainability and effectiveness of such programs, the Moroccan government has put into force on January 1, 2010, Law No. 34-09 on health. In addition, this framework law allows private organizations to contribute to improving health services. It also represents legislative and organizational avenues to better organize the interaction of actions between stakeholders, public bodies, private bodies and patients/citizens through the establishment of mechanisms focused on preventing and controlling diseases and health risks. It also includes provisions to protect the rights of consumers and health professionals and ensure pharmaceutical products' safety and security.

3.3 The introduction of the new dual 2RM approach in the implementation of an integrated management system:

The dual 2RM approach represents the interaction between the search for performance according to risk minimization and Richness maximization, that is, in a tangible or intangible way.

3.3.1 The purpose of introducing the concept of Dual:

The concept of duality also called the "dual approach", refers to an approach that aims to balance two opposing or complementary elements.

From the Latin dualis ("two"), dual is a concept that involves an interaction, an interchange between two things. Thus, in our context, the manager must resolve an anomaly or a dysfunction according to two approaches or two objectives: either he seeks to minimize the losses that this anomaly may cause, or he can take advantage of the opportunity to proceed with an improvement that will allow him to take advantage and maximize the return by remedying the situation!

It is then an interaction between two rival objectives of the manager: to have a Minimum Risk or to ensure a Maximum Richness. Such an interaction requires a certain amount of information, which can only be guaranteed through a reliable and adequate information system.

This approach can be used in various domains, such as project management, quality management, human resources management, and so on. Here are some examples of areas where the duality concept can be implemented:

- Project Management: The dual approach can balance time, cost and quality in project management. For example, a dual approach can maximize project quality while minimizing costs and meeting deadlines.
- Quality Management: The dual approach can be used to balance customer satisfaction and operational efficiency in quality management. For example, a dual approach can improve customer satisfaction while reducing the costs associated with returns and complaints.
- Human Resource Management: The dual approach can be used to balance the needs of employees and the organization in human resource management. For example, a dual approach can aim to improve employee motivation and well-being while maximizing their productivity and contribution to the organization's development.

In optimization theory, the duality or duality principle refers to the principle that optimization problems can be viewed from two perspectives: the primal problem or the dual problem, and the solution of the dual problem gives a lower bound to the primal (minimization) problem.

According to some authors (Javel, 2010), the manager must optimally achieve his objectives in the primal sense (a Minimal Risk) or the dual sense (a Maximum Richness). This expresses the achievement of the extraordinary performance of ordinary persons (Toyotism approach)!

On the other hand, it is not easy to proceed with this dual approach without implementing a reliable and adequate information system. This is the case, for example, for a manager of a company at risk of failure who is trying to develop it!

In the health sector, the question is more profound. Converting risk into Richness without implementing such a system can be an almost impossible mission because the risks are irreversible in this sector.

3.3.2 The purpose of introducing the concept of Dual: he integrated management system, according to the dual approach 2RM

A public or private organization has a certain number of means and skills to offer a product or service available to the applicants of this product or service according to a given quality and a requested quantity. It is then a question of managing the exchanges of flows between the internal and external environment of this organization, during which anomalies can appear and negatively impact the deployment of the prepared product or service!

This is also the case in the health sector, during which the speed of information management represents a determining factor of risk and opportunity (that is. benefit) by the urgency of medical interventions for the benefit of patients at risk, availability of places, availability of means, availability of human resources ... and so on.

The provision of an integrated management system recommends to the manager or to the decision system the actions to be undertaken to achieve the following goals:

- Minimize risks by anticipating anomalies and errors that may be committed.
- Optimize the stocks by preparing the necessary means rationally and efficiently.
- To reduce the weight of the work in progress regarding the intervention time and completion of the operations.
- To reduce the cost of products/services, the exhaustion of financial resources can cause operating and/or service anomalies. It is, therefore, necessary to act at the financial level in a flexible and well-studied manner.

Managing effective information flows and collaboration between different healthcare departments and professionals was crucial during the crisis. The integration of intelligent digitalization could improve this coordination by facilitating the sharing of relevant information and supporting more informed decision-making (Heuvelmans, 2015).

This approach also enables the system to develop horizontally or vertically, aiming for maximum performance or profit. Thus, managerial duality is strongly imposed, directly or indirectly, in any organization and can be exhaustively orchestrated by:

- Flow control, ensuring the availability of the information needed to make decisions and take action, enabling the degree of Richness in Risks and Opportunities to be measured.
- Production or service planning: The integrated information system favors project and objective-based work, involving a succession of well-studied actions and interventions, with fewer risks and more precise objectives.

Thus, in order to maintain contextual fluidity, the integration of intelligent digitization into information flow management becomes an essential aspect, enabling the organization to react proactively to challenges while maximizing opportunities for performance and growth.

3.4 Proposal of an algorithm for an oriented continuous improvement of sustainable performance and governance:

3.4.1 Dual 2RM Algorithm:

In a systematic way, and to achieve the goals of the dual approach 2RM according to a specific process of oriented continuous improvement based on the implementation of an integrated management system in the Moroccan health sector, we propose the following algorithm:

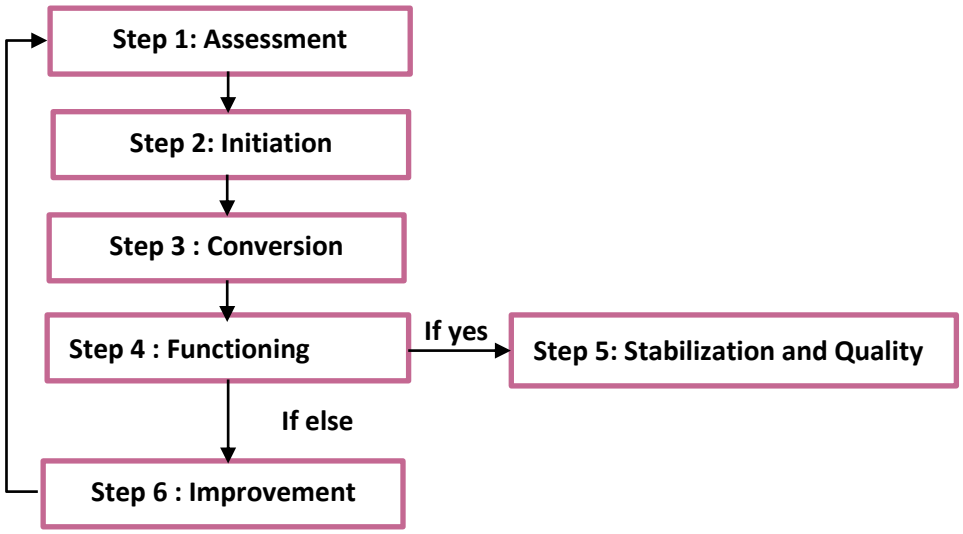

Figure 2. Dual Algorithm 2RM

STEP 1: Assessment

This is the assessment of the state of the management and operational mechanisms within a framework of calculating the gaps between different parameters of risk and Richness, respectively. This also allows for the assessment of the degree of anomaly and performance. A unique permanent or occasional commission must be set up for this mission. It must deal with the following three scenarios, deduced from the game theory:

- Scenario 1: The objective = the realized
- Scenario 2: the objective ≤ the realized
- Scenario 3: The objective ≥ the realized

The evaluation and analysis of each scenario should focus on the adequacy of the objective and the means deployed to achieve it.

STEP 2: Initiation

Following the results of step 1, the initiation step should focus on branching the objective and/or the means deployed up or down optimally and rationally.

The special committee must determine the elements affected by the planned changes that can converge toward the two dual goals: Minimum Risk and Maximum Richness.

STEP 3: Conversion

The recommended ramifications at the level of objectives and deployed means must be followed by operational actions that allow the conversion of anomalies and dysfunctions into opportunities and the development of the system.

STEP 4: Functioning

Once converted, the new devices must operate by the new guidelines with full respect for the rigor and quality of operation.

STEP 5: Stabilization and Quality

According to a priori established standards, one can deduce the existence or not of system stability and quality of operation, which can be justified by decreased complaints and good system profitability, pending a change in guidelines and strategy.

STEP 6: Improvement

If such stability or quality is not achieved at the beginning or after a period of operation, one returns to step 1 in a state of mind of continuous improvement and qualification.

3.4.2 Algorithm Support Elements:

In the health sector, operation stability must be ensured perpetually due to the nature of its activities, which affect human life and represent the primary capital of nations!
Thus, our Dual 2RM Algorithm presented in this paper aims, among other things, to achieve the required operation and quality stability. However, applying this algorithm requires supporting elements based on classical continuous improvement methodologies but adequately integrated into the proposed management system to get the oriented continuous improvement level.
These support elements must be applied at two levels: strategic and operational.

i. Strategic level:

At this level, the management system must interact with the supreme strategic level, which represents all of the government's programs and legislative and operational directives, and with the organizational strategic level, which represents all of the goals undertaken by the organization's board of directors.
The aim is to implement the organizational strategies in the public or private health units that will enable the objectives set at the supreme strategic level to be achieved, based on the recommendations of the special commissions according to the scenario described in step 1 of the dual 2RM algorithm above.
In this context, we can use the QRQC (Quick Response Quality Control) evaluation methodology, according to the PSEI (Integrated Evaluation Simulation Process) that we propose as follows:

Phase 1: Collection of anomalies

This is the collection of all the information on anomalies or dysfunctions observed by the stakeholders: patients, citizens, doctors, nurses, etc...

Phase 2: Anomaly analysis

The unit and department managers must analyze and interpret the information collected in Phase 1. Observations and recommendations that can explain such anomalies and dysfunctions according to their visions and positions of responsibility must be declared by a procedure manual and operating and quality standards. Thus, to be operational and practical, such information must be classified according to the following criteria:

Table 1. Matrice d'Urgence et d'Importance

Urgent	Important
Urgent/Urgent	Important/Urgent
Urgent/Important	Important/ Important

These anomalies must be processed according to a permanent or cyclic schedule (generally weekly on a fixed or random day).

Phase 3: Audit and Decision Making

Once the information has been transmitted to the managers and central directors, an Audit action should be undertaken to rationalize resolving anomalies and dysfunctions globally or partially. The new guidelines and recommendations must be passed on to the stakeholders in a hierarchical and empowered manner to initiate the functioning of the processes correctly and beneficially.

It should be noted that the set of anomalies and malfunctions must be recorded and followed by the nature of the correction made and the improvement obtained to constitute a procedure manual of oriented permanent improvement. This manual represents an operational guide of the QRQC methodology specific to each organization that applies the dual 2RM algorithm.

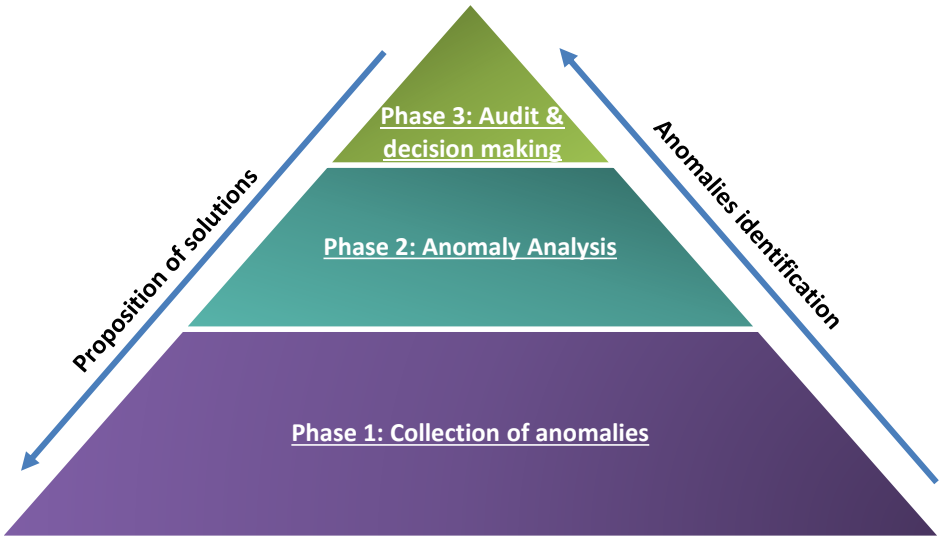

Figure 3: The QRQC Integrated Evaluation Simulation Process IESP[1]

ii. Operational Level:

At the operational level, we propose the implementation of a joint process composed of the vector associated with the SMED (Single Minute Exchange of Die) methodology, whose objective is the minimization of work in progress and dead time of action and reaction, and another vector associated with the Japanese method of 5S, which allows among other things the achievement of total quality of the system operation. We recall that the two methodologies are essential for continuous improvement in the industrial and production sectors! However, in the service sectors, their use is rarely noticed. Therefore, it's strongly recommended that this standard process be introduced in this sector in an appropriate and adapted way to reduce the time of intervention and execution of tasks and to increase efficiency and performance.

- *Mixed process of SMED and 5S:*

The operational approaches allowing the joint improvement of the health service and its quality can be implemented within a specific perimeter of a service or a department of a health organization as follows:

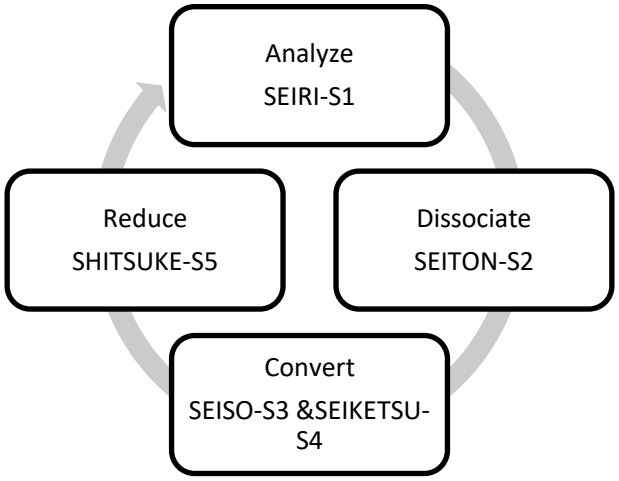

Figure 4. Mixed Process of SMED and 5S MPSS[2]

[1] Integrated Evaluation Simulation Process
[2] Mixed Process of SMED and 5S

Step 1: Analyze the lateness:
This step aims to identify the resources (human or material) and the tasks responsible for the lateness in the realization of the scheduled operations, representing a dead time of the service or an increase in the work in progress. Such an identification will be carried out according to the first S (Seiri) to separate what is up to date from what is late.

Step 2: Dissociate the lateness:
In this step, we must organize the completion of subordinate tasks in hidden time to catch up with any lateness. This can be done by using the second S (Seiton) through the optimal organization of what is on time to support what is behind. However, other means of support can be put in place to save dead time. Theoretically and in the industry, this step allows a production gain of 30 to 50% (profit maximization).

Step 3: Convert the lateness:
This involves activating the overdue tasks, removing obstacles and reducing changeover time (as in Step 2). Optimal programming of tasks and dead time related to changeover time should be considered by applying the third and fourth S (Seiso and Seiketsu).

Step 4: Reduce and improve the lateness:
This is a monitoring and evaluation step of the effectiveness of the changes made in the previous steps, using the fifth S (Shitsuke), allowing the measurement of the rigor of the SMED methodology approach.

However, the specificity of the health sector in Morocco requires the empowered application of this mixed process of SMED and 5S. This accountability can be initiated hierarchically (using a service mapping) or nominatively (using a work-by-objectives approach). In addition, the rigorous application of proposed processes increases service quality and minimizes risk within each scope of their implementation. The global compensation of the selected local improvements converges towards a continuous governance improvement. In this regard, some studies link 5S to aspects of the Japanese management approach, which are aligned with an integrated management system rather than just a management tool or technique. (Rod Gapp, 2008).

3.5 Proposal of an algorithm for an oriented continuous improvement of sustainable performance and governance:

To measure the degree of performance of the oriented continuous improvement deduced by the implementation of the above algorithm and processes, we propose the use of a certain number of indexes, according to the dual approach, which focuses essentially on the anomalies to be remedied, especially in terms of time and cost:

- Lateness Index:
  For an activity A_i, we note the elementary Lateness Index:

$$I_{i,r} = \frac{\Delta t_i}{T_i}\ id_{\{\Delta ct_i \geq 0\}}$$

And

$$I_R = \sum_{i=1}^{n} I_{i,r}$$

The overall lateness index,
where $\Delta t_i = t_i - T_i$

with

$$\begin{cases} t_i \text{ represents the time spent in the realization of the task } A_i. \\ T_i \text{ represents the time reserved for the realization of the task } A_i. \end{cases}$$

And $id_{\{\Delta ct_i \geq 0\}}$ the indicator function which is 1 or 0.

- Index of Unprofitability:
  For an activity A_i, we note the index of elementary Unprofitability:

$$J_{i,Nr} = \frac{\Delta ct_i}{Ct_i}\ id_{\{\Delta ct_i \geq 0\}}$$

  And

$$J_{NR} = \sum_{i=1}^{n} J_{i,Nr}$$

  The Global Unprofitability index was recorded by the period of simulation of the algorithmic procedures to evaluate the degree of oriented permanent improvement. The cost differential Δct_i represents the difference between the actual and committed costs of performing the activity A_i.

- Index of Non-Efficiency:
  Such an index can be structured as follows:

$$K_{NE} = \frac{Number\ of\ claims\ registered}{Number\ of\ Activities\ Performed}$$

  This index can vary theoretically in the relatively accepted interval [0;1], or the interval]1; +∞ [which means a very critical situation of non-efficiency.

4. Conclusion

Clearly, the health sector represents a crucial sector for every nation and the world. This becomes more visible and significant in the case of health mega-crises (COVID-19...) or the case of natural disasters (Syria-Turkey earthquake'23...). The activities and interventions of the different actors in this sector need to be well organized to achieve the objectives with less risk and more efficiency.
In this paper, we have presented a projection of several methodologies applied, particularly in the industrial and production sectors, for the benefit of this health sector, according to a new dual 2RM approach. The structural introduction of this duality allows public or private health organizations to balance their performance at the Risk and Profitability levels. For this reason, we have presented in this paper a Dynamic 2RM Algorithm allowing a permanent evaluation of the performance and the verification of the three scenarios of the fluctuation of the gap between the objective and the achievement (according to the game theory).
The service and work quality factor is essential in the health sector to optimize and rationalize the generally limited means. In this context, we have proposed using The Integrated Evaluation Simulation Process IESP of the QRQC and the Mixed Process MPSS of the SMED and the 5S, representing support tools for an oriented continuous improvement. To quantify the state of this improvement, we have proposed calculating a certain number of indexes: Lateness Index, Non-Profitability Index and Non-Efficiency Index, because the improvement must focus on the anomalies to be remedied.

On the other hand, perfect governance in the health sector cannot be improved by legislative or managerial regulations alone but also with the intelligent involvement of stakeholders. The proposed processes and algorithm can guide the organization and restoration of total quality and extraordinary performance mindset optimally and rationally. The limits of applying these tools lie in respecting the rigor of the evaluation and the amount of information collected to have significant indexes. The cost of the simulation of the tools thus proposed is relatively justified about the losses to be avoided and the expected benefits.

In summary, the imperative for the future lies in a proactive commitment to research and development, ensuring the continual adaptability of methodologies and algorithms to unforeseen challenges. This forward-thinking approach, coupled with a persistent exploration of emerging technologies, promises to be a driving force in advancing and sustaining healthcare practices globally. The dynamic nature of the field demands a continuous effort to stay ahead of unforeseen challenges, making innovation a cornerstone for the future of healthcare.

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