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IMPLEMENTATION OF A STANDARDIZED SYSTEM OPTIMIZED BY LEAN MANAGEMENT APPROACHES

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ABSTRACT

The work presented in this paper concerns a merger approach between Lean Management and the implementation of ISO type certification. We have described this approach as "Lean Normalization". It proposes a new way to approach the implementation of ISO standards in a company, with six steps inspired by the main concepts of Lean Management. After a state of the art presenting the ISO, its history and the various normative versions, we propose an analysis of the different approaches and definitions of Lean Management. This analysis is based on an extensive bibliographic study of the field for several years. The bibliographic study coupled ISO / Lean allowed us to identify the following problematic: the attempts of fusion between these two approaches do not emerge on a modelling proposal putting in synergy with ISO and Lean Management. As a result, we propose an innovative approach that we have described as "Lean Normalization". This approach takes place in six stages: the Documentary Muda, the Documentary Fair, and the Design of the Continuous Improvement Process, the Exquisite Quality, the Visual Management, and the Animation of the Quality Management System. The implementation of this approach is based on a project approach consisting of ten milestones. Following the application of our approach in different companies, and after noting the inefficiency of traditional certification audits, we open new horizons by proposing a different vision of the audit based on the Stress Test Organizational.

Keywords - Lean Management, Performance, Standard, Audit, Stress Test.

Introduction

Performance and competitiveness have become the leitmotif of companies wishing to stand out against the globalization of the economy. Moreover, in a context of "economic war" in which it is not possible to date to know the winner and the losers, this search for performance and competitiveness

stands out as one of the solutions to survive, grow and win. The Internet has upset consumer habits and fostered a global globalization of the economy through agile, efficient and above all very opportunistic organizations. ISO is an international organization that offers a catalogue of standards covering many fields and covering various fields of application. Thus it is possible to have a common language of communication between globalized players. This common language can be technical (for example: the standardization of lamp holders which has made it possible to obtain an international standard, or the gauge of railways that made it possible to travel in Europe without a train change), which is safe (for example : the field of nuclear or avionics), but just as organizational. This is the case of the series of ISO 9000 standards which deal with business organization and efficiency.

The standards proposed by the ISO allow companies to obtain certification in the fields of Quality (ISO 9000 series), Environment (ISO 14000 series), or Health / Safety at work via the series. Companies or organizations wishing to obtain certification usually put in place a management system. This is known as the Integrated Management System (IMS). An IMS specifies the company's policy and the objectives to be achieved. IMS companies are organized around a QSE (Quality / Safety / Environment) group certification. They include standards related to Quality (ISO 9001 standard), standards related to environmental management (ISO 14001 standard) and those related to occupational health and safety management (OHSAS 18001 standard).

ISO in Research

In order to better understand ISO in the world of research, we propose an analysis of publications and scientific books dealing with the ISO 9001 standard. We have identified quite a few articles dealing with the ISO 9001 standard as a thematic research. Since ISO standards have been fully updated (in both form and substance) during the year 2000, we have chosen to focus on publications published as of that date. Indeed, previous versions of ISO were very oriented towards document management, and the demonstration of the certification of the companies was then more based on an existing documentary system which no longer needs to be from the 2000 version. The themes are varied, however it is possible to categorize by theme most publications.

Thus publications deal with the implementation of ISO in geographical areas:

- ISO implementation in a Norwegian company,
- Implantation of ISO in Turkey
- Implementation of ISO in a country
- Implementation of ISO in the world
- Efficiency of ISO in emerging markets

Publications are also sometimes more targeted and are then sectorial and / or geographical:

- Implantation of ISO in restricted areas such as microenterprises
- Use of ISO in teaching
- Establishment of ISO 9001 in the olive oil industry in Spain

A theme also emerges from the current publications, it is then associated with the economic performance:

- Economic performance / advantage / disadvantage and ISO
- Competitive advantages of ISO implementation
- Economic impacts of different versions of ISO
- Comparison between certified and non-certified companies

The theme of management is also addressed through various publications:

- Codification of knowledge or skills
- the implementation of ISO
- Analysis of the decline in the accident rate following the implementation of ISO
- Impacts on operators
- Link between ISO 9000 and management practices

The theme of the impact on related functions or methods is also discussed:

- Impact of the implementation of ISO on technologies
- Reengineering processes
- Link between ISO and marketing
- Impact of ISO on production
- Study of synergies, or debates, between TQM and ISO
- Link between ISO and the supply chain
- Impact of contextual factors on the implementation of ISO

The ISO 9001 standard is a globally recognized standard because it allows companies deciding to be certified to communicate on a certification, and so position against the competition. The standard has a history, and a de facto recognition, since its first edition of 1986 and its recent update in 2015. A certification allows to obtain beyond the organization, an international recognition allowing to obtain a growth by the conquest of markets more and more demanding. The ISO 9001 standard is based on formalized evidence that is reviewed by auditors during third-party audits. The documentary structuring has evolved towards a noticeable relief during the 5 current versions. However, the principle of "formalize to prove" to obtain certification remains a barrier to the implementation of this standard. This criticism is often highlighted by the detractors of ISO 9001. Thus Liker (2004) addresses the family of ISO 9000 standards in these terms: "Initiatives like ISO-9000 preconise companies to have standardized procedures and meticulously and make companies believe that it is enough to enact the rules for them to be applied. In addition, Quality Managers dissect tons of data by applying statistical analysis methods, while most are useless. This analysis is therefore not very favourable to the image of ISO, which seems to create documentary entropy and data. In addition, a continuous improvement approach that goes through a documented formalization phase does not make the ISO approach "attractive", while other philosophies allow, without excessive documentation, to make an organization perform; one of the leitmotifs of Lean Management.

Lean Management

Lean Management is a synthesis developed by Womack and Jones in 1990¹ following the observation of the operation of global car manufacturers, mainly Toyota. The latter has actually developed an original production system in the 50s through the contributions of two engineers: Taiichi Ohno and Shigeo Shingeo. The concept originally applied to production, using Japanese methods such as: KANBAN, SMED, TPM, Zero-defect, The Americans then extended it to the whole company by giving it a theoretical framework. Thus, to understand Lean, one must first understand the Toyota Production System (TPS). Tastily, the English word LEAN means thin, thin even agile, because a company LEAN is above all a company which has decided to alleviate superfluity to become reactive in an unstable world context. A significant amount of publications and books were then issued on this philosophy, which was not based on a documented system as required by ISO, but on concepts and

principles. There is also a project Lean Management deployment project that Liker² proposed, and that we will analyse in the coming sections of paper.

Lean Management is a collection of principles and methods. Numerous publications deal with Lean Management, and we have identified a major history of publications by Holweg in 2007³.

Definition Lean Management

Surprising as it may seem, there is no common or standardized definition of "lean management". Take the case of Hohmann's⁴(2014), who is the second author to have published a book clearly titled "Lean Management". The author proposes a first definition: "Lean can be defined as a system that aims to generate the maximum value added at the lowest cost and the fastest, by using the right resources to provide customers with value that is valuable to them".

Then, Hohmann adopts the Womack definition: "Lean is the observation of an operational system through a prism that reveals the value, the flows, and the potentials to pull the flows and strive for perfection" (p.91).

Review of Literature:

We took the principles listed in the analytical work Lyonnet⁵ and identified few new authors from publishing his thesis to date, citing the Lean Management.

Analysis of the links between economic performance and the tools of Lean Management.

- Links with Lean Management and performance applications,
- Links between TQM, economic performance and MSP tools, links between Lean production and TPM,

Analysis of the links between Lean Management and the 6 Sigma methodology.

- Importance of management in the implementation of 6 Sigma⁶, application of the 6 Sigma methodology⁷

Use of tools helping to implement Lean Management.

- Use of visual map of operations,
- Use of MSM in Lean Management,

It is ultimately very difficult to conclude on what is Lean Management, the bibliography rarely gives precise definitions, or this definition is argued at length⁸:

"The genealogy of Lean makes it possible to understand the strong lineage with Toyota⁹. Lean is the result of academic reflection on best practices in the automotive sector. The TPS was then understood as a production system focused on satisfying the customer's wishes. This is why the main principles of Lean have been developed around the value for the customer:

- define the value,
- identify the value chain,
- get a feed,
- pull the production,
- Aim for perfection.

As a support for this logic focused on value, the Lean production system is built on an operational system faithfully copied from the Toyota Production System, but also a management system around teamwork and a culture of the company with a state of the art, spirit and particular behaviours"¹⁰

Therefore, we will consider that Lean Management is more of a philosophy based on the 6 concepts developed in the thesis of Lyonnet, namely:

- The elimination of wastes
- Just in time
- The amelioration keeps going
- The perfect quality
- Visual management
- The management of men.

The merger between Lean Management and ISO

Understandably, ISO 9001 provides a structured organizational vision and Lean, in isolation, aims to generate operational efficiencies within business processes. In order to guide the QMS towards a greater focus on increasing the value added of the processes, it has naturally proved appropriate to consider combining the two models harmoniously in order to combine a highly structuring system approach and a particularly operational approach and economic. This idea finally quite simple, but whose implementation is much more arduous, led to an abundant literature on the general theme of the synergy of Lean Management and ISO 9001 in order to build a new paradigm socio-organizational. It is for these reasons that in the next sections of our brief we will address the following points:

- The approaches combining Lean and Quality Management System (but not explicitly speaking of "Lean and ISO").
- Criticisms of approaches proposing fusion.

According to Aziz and Hafez¹¹, it is possible to install a link between Lean Management and a Quality System by dealing with the Perfect Quality stage, through the use of a Quality Oriented System process and thus dealing with the performance of its realization. There is no link to ISO, but rather a use of the systemic approach (process-oriented as advocated by ISO) as a tool for problem detection. The capitalization of know-how is achieved through the implementation of procedures (which is also recommended by the ISO). If the link with the ISO is not formal, we still find this aspect of standardization in the models proposed by the authors (Figure 1).

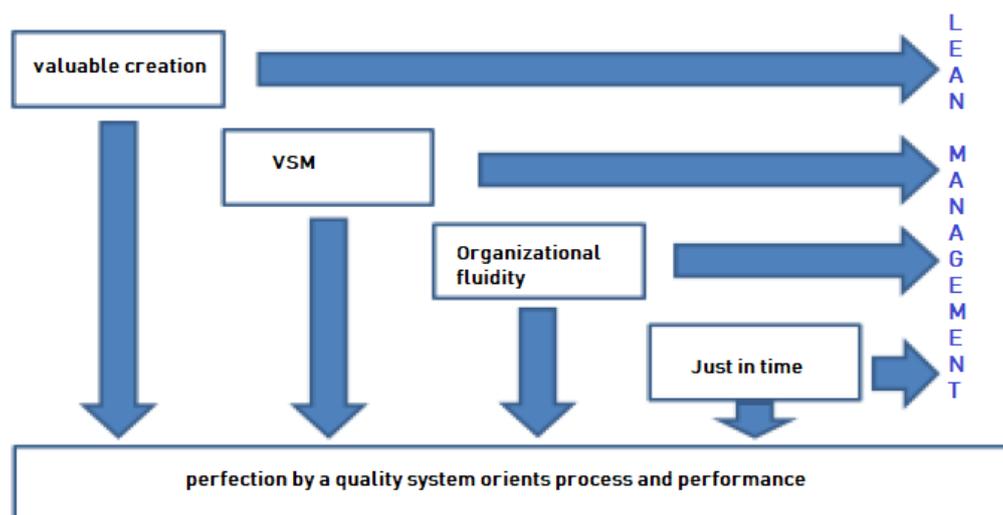


Figure 1: The principles of Lean by Aziz and Hafez.

Lean Normalization

To improve the implementation of an ISO standard, in synergy with Lean Management, we propose to follow a generic model that we will call "Lean Normalization" (Figure 1). This model makes it possible,

from a lambda business situation, to implement an ISO standard while relying on the 6 Lean concepts. The objective is to achieve a certified and agile organization (as defined by ISO and Lean).

The use of the SADT model

All the models presented are formalized according to the functional analysis approach SADT (Structured Analysis and Design Technique). The general model (called "A-0 level") is broken down into more specific models.

The choice of presentation of our model, via SADT, was carried by the fact that this method of modelling of the standards, allows not only a graphical description of a complex system by functional analysis downward, but also an analysis which walks of a general model (called "level A-0") to the stage detail, or milestone. This allowed us to make the link with the concepts previously selected dealing with Lean Management, and the implementation of an ISO standard.

The application of SADT to the proposed model

In order to adapt the SADT method to our model, we used the same notation rules for Aijk with a certain rating for the identification of inputs, outputs, constraints and supports:

- System function: A; an activity of the process,
- Incoming work material: E; an input element of the process,
- Outgoing work material: S; an output element of the process,
- Control constraint: C; a constraint of the process,
- Added value of the function: M; a support of the process

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A function is thus represented by a "box" or "module" SADT (datagram) (Figure 2). Arrows symbolize the elements of links between boxes. However, they do not act as a command or sequencing in the strict sense.

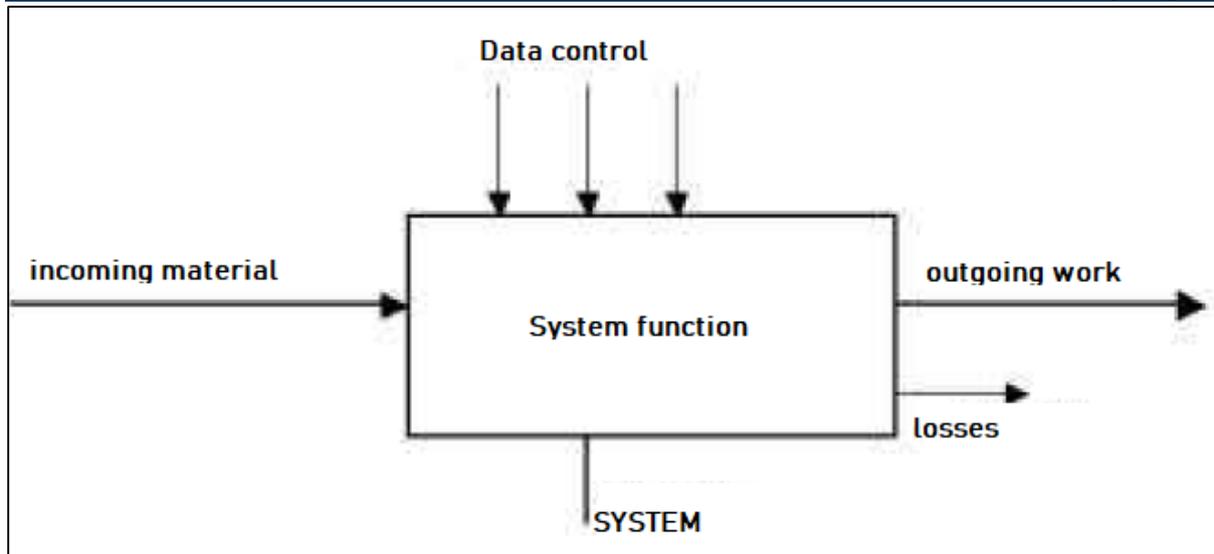


Figure 2: The SADT model.

A SADT box is represented by a rectangle containing:

- An infinitive verb defining the action and the added value of the function;
- Its label Aijk of identification: the letter A of the label meaning "Activity", i the generic chronological number of the model, j the sub-process associated with the chronology, and k the chronological number of the inputs / outputs of the processes.

On this box end or leave:

- Downward vertical entry arrows representing control constraints (often informational and immaterial);
- Upward vertical entry arrows (system) representing the added value of the function (often informational and immaterial);
- Horizontal exit arrows representing the input and output material (often informational and immaterial).

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THE GENERAL MODEL

We propose a model that synchronizes in a global way the 6 concepts of Lean Management proposed in chapter 2. Its objective is the implementation of a Management System conforming to a standard, and therefore certifiable in the state. In addition, this model respects the Lean philosophy. Our starting point is the organization of the company (input element E0), and the general output is the obtaining and implementation of an optimized Management System and complies with a standard

(output element S0). To do this we have in constraint (C0) the requirements of a norm, and we have in support a Lean Approach (M0).

At first, it is a question of making a "Muda Documentary", then a "Just Documentary" which aims to control the documentary entropy via a standard. The transition from the documentary system to the management axes is then ensured by a phase of "Improvement Process Design". Once these three concepts are deployed, it is then possible to implement asynchronously the "Exquisite Quality" based on "Visual Communication" and "QMS Animation" (in the case of a certification ISO 9001). The general model, which presents the A-0 level of modelling and its first declination, is presented in Figure 23^{12,13}. This model takes the 6 concepts of the philosophy of Lean Management, but adapted to the implementation of a standard.

The constraint is therefore for the company, the respect of the requirements of the ISO 9001 standard to obtain a certification. The support elements are the 6 concepts of Lean Management.

Starting from the application of the concept of "Documentary Muda" which aims to identify the documents just needed to obtain a certification, the next step "Just Documentary" allows to integrate into the QMS the constraints organizational, and existing, business. The engine of certification finds its place thanks to the "Improvement Process Design". The "Exquisite Quality" steps that can use / exploit the principles and tools of Lean Management, "Visual Communication", which aims to make the Management System understood and used by all employees, and "Animation" of the QMS "(as part of an ISO 9001 certification) that allows the operational animation of the standard desired by the organization. These steps take place asynchronously.

The 6 steps of the model will be repeated and discussed in the following paragraphs of our brief. We have decided that to illustrate our model, we will apply it exclusively to the standard ISO most common, ie: ISO 9001 v2015, which deals with Quality Management.

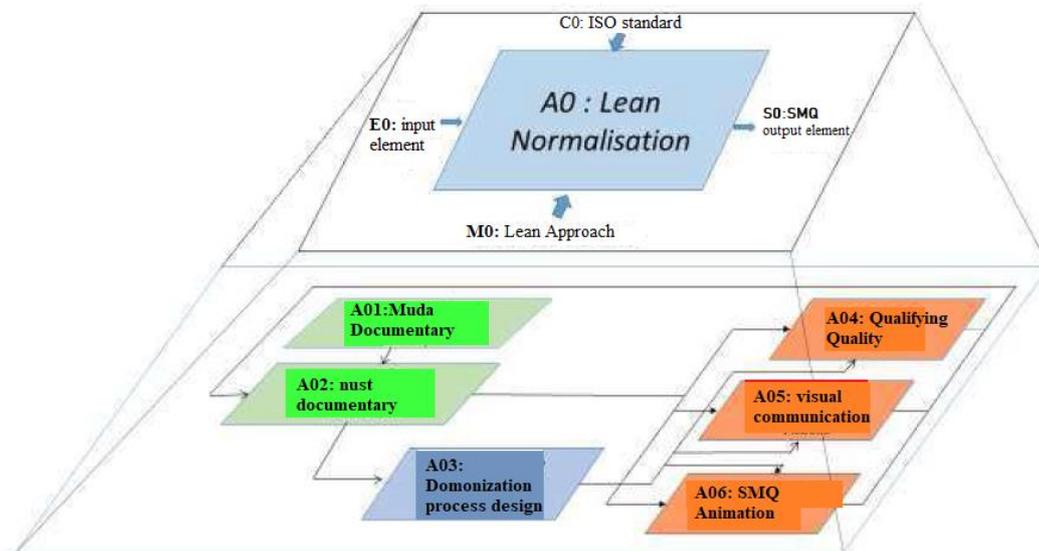


Figure 3. The global model of Lean Normalization

DETAILED PRESENTATION OF THE MODEL

Muda Documentary: This phase makes it possible to identify, through the analysis of a standard, the documentary structuring required as well as the required quantity of documents just needed. We propose as a definition of "Muda Documentaire" (Figure 4): Analysis of the documents required by a standard (including the structuring, the typology and the number of documents required). We propose to clarify this phase by relying on the requirements of the ISO 9001 standard.

This step remains the same whatever the versions of the ISO 9001 standard (2008 or 2015 version), only the quantity of deliverables diverges.

E011: We use as input the "Documentary Muda" standard that wants to implement the organization. It should be noted that at this stage of the modelling, we do not take into account the existing documents within the company.

S011: We obtain at the output of "Muda Documentaire", the documentary requirements, namely: the typology of the documents required by the standard, and their exact number. The documents required by the standard are of 3 types: manual, procedures and recordings. The output S011 - Document Requirements will be used as the constraint element in the next block A02-Just Documentary.

Objective: The "Muda Documentary" allows to analyze the just required documentary requirements of a standard. It is a question of not "inventing" documentation at the source of the documentary entropy identified by Micklewright¹⁴. For example, if we are dealing with the ISO 9001 V2008 standard, it is required: an organizational manual, 6 procedures and 19 recordings. For the 2015 version of ISO 9001, it is required: an organizational manual, 3 procedures and 23 registrations. Explanations of the different steps: Phase A011 - Reading and identifying the documentary typology uses the summary of the standard (C0111) and the required document structuring (M0111) identifiable in the text of the standard. From this step, we obtain a documentary typology (S0111) (Manual, Procedure, and Registration). The next phase A012- Identifying documentary requirements allows precise identification of volumetric requirements documentaries. To do this, we use the constraint C0121 - Presence of the verb "must" in our process. It is then easy to make an array identifying typology and number of document when applying this key reading to a standard. We can then output document A01 - Muda Documentary requirements (S011) with, for example, a table showing the chapters of the ISO and indicating, for each of them, the number of documents required and their typology.

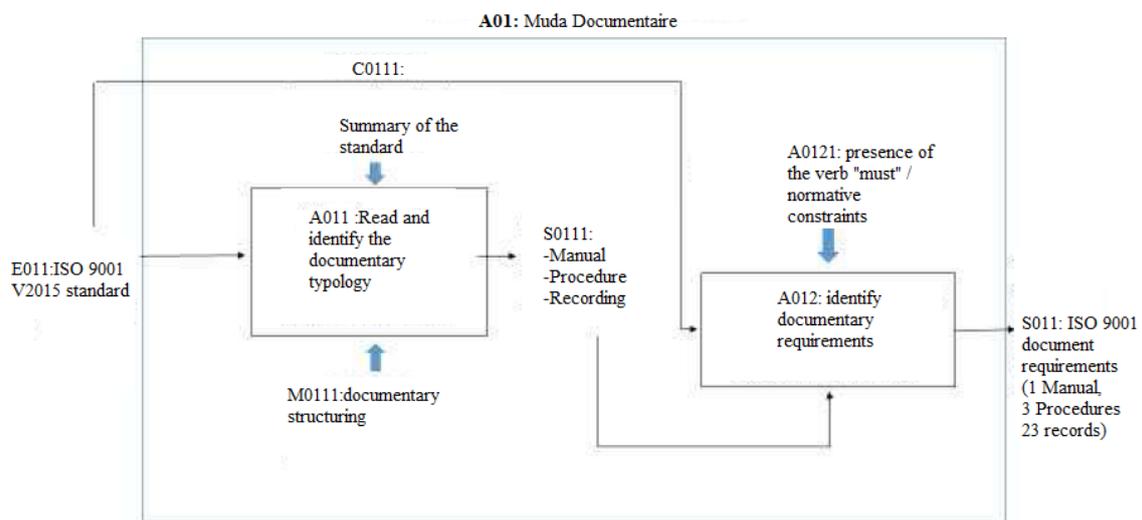


Figure 4: The Muda Documentary.

Just Documentary

The objective of this level is to align the company's own documentation with the documented requirements of ISO, and to optimize it to the best. Thus, the documentation specific to the company and that required by the ISO are found controlled and framed. This is what we will call the "Just Documentary". This is to ensure the consistency of the normative requirements with the existing organization of the company. We propose to clarify this phase by relying on the requirements of the ISO 9001 standard.

E021: We are using the already existing documentation describing the organization of the company: organization chart, job description, internal procedures already in force, etc It is sometimes possible that no organizational documentation is available, in this case it is necessary at least to create a flowchart and formalize function definitions for managers.

S021: The QMS is then consolidated and conforms to the standard, so it can be "certifiable" from a documentary point of view. It consists of: a quality manual on a page, which can be easily presented and distributed in a poster format, 3 procedures and about twenty records (the number of records differs depending on the size of the company and its scope of certification).

Objective: The objective of this step is to produce for the organization the uste documentary level necessary to obtain a certification (without entropy documentary). Explanations of the different steps: To master this so-called "Just Documentary" stage, we use the procedure of "Document Management" (which is a procedure required by the standard and one of the output elements S021) but in a different way from the "us" and customs "that we have seen in most certified companies. Indeed, most certified companies use their document management procedure as a process for referencing documents.

Thus, thanks to the step A021- Synchronize the normative requirements with the context of the company, we will synchronize the already existing documents, and necessary for the proper functioning of the company (M0211), with the output elements of A01 - Muda documentary, namely the number and typology required of the documents identified in A01. It is then possible to optimize the documentation (A022), for example by using "tricks" proposed by the standard (M0221: contraction mechanisms of documents authorized by the standard), but while remaining attentive to not being out of the ordinary (C0221). At the end of this "Just Documentary" step, we get the documentation of an optimized QMS. We note, however, that this step, as well as the previous one, are exclusively documentary and non-applicative steps of the standard. It is then necessary to proceed to the next steps, which will allow an operational implementation of the standard.

Design of the Continuous Improvement Process

Once the QMS is optimized in a documented way, it is necessary to switch to the managerial part of its implementation, which is what we call "Designing the Continuous Improvement Process". We propose to define the "Improvement Process Design", as the implementation of optimized processes by applying the principles of Kaizen and Hoshin¹⁵. We use as input the "Continuous Improvement Process Design", the output of the "Just documentary" stage, namely: S021 - SMQ optimized and adapted to the company. This entry includes all the optimized documentation of the company.

S031: Operational SMQ via Continuous Improvement and Management Review Reports or Process Steering Committees. These attest to the effective implementation of Continuous Improvement in PDCA mode.

Explanations of the different steps: Continuous process improvement requires an analysis of the requirements of ISO 9001 by identifying a "due" mapping of all processes; this map is located at the input S021 in the quality manual, and it is validated by the COPIL in A031 -: Mapping and defining the objectives of the processes. In order to improve their performance, the company processes are monitored (measured, evaluated, improved) by the COPIL. Process measurement takes into account normative, regulatory and legal requirements (C021).

Process evaluation and improvement take into account customer requirements (C031). The key to the success of this step is the M031- Steering Committee (COPIL) in Hoshin and Kaizen mode. In fact, we recommend that this committee work in sequential mode and on one-year cycles. In A 032 - Measuring Processes, the COPIL will define the year's objectives and the associated measurement systems to be able to decide on the performance of the organization's processes. Thanks to S0321- Process Performance Dashboard, the COPIL will be able to identify processes that are in phase with the given objective, or any excesses that will need to be addressed through improvement actions (S0331) . These

actions will then enable the implementation of process improvement (A034). It is important to emphasize that the company maps its own processes. This is favorable for documentary entropy, because each manager will wish to be a pilot of the process, which risks multiplying the processes. In fact, ISO proposes to identify them directly in the organization. The 2015 version is very clear on this point, because it identifies precisely 10 processes (Management, Continuous Improvement, Marketing, Design Office and / or Research and Development (BE / R & D), Purchasing, Production, Delivery, Human Resources, Maintenance in Operational Condition (MCO), Information System (IS)).

Exquisite quality

Once the QMS is optimized and implemented (steps A01, A02 and A03), it can be used to drive the Quality of the enterprise. Various tools can then be implemented to contribute to this step, and the principles of Lean can naturally be used. We propose for definition of the "Quality Exquisite": Improvement of the Quality of the organizations, or product / service by using the concepts, principles and tools of Lean Management. We propose to clarify this phase by relying on the requirements of the ISO 9001 standard.

S031: We are using the operational QMS from A03 - Continuous Improvement Process Design. Indeed, the quality due, or due, is implemented by the animation of the processes identified, and facilitated via the Steering Committee of the processes. This consists in implementing the necessary actions (organizational or operational) to achieve the objectives identified in advance. Actions often take the form of a performance improvement plan.

S041: All stakeholders or interested parties of the company are then satisfied by the quality level of the company (both organizational and production).

Explanations of the different steps: We recall that the QMS has become "leanified", that is to say that it is just necessary "documentarily". Lean concepts / principles and tools

Management then become both compatible with the QMS, and able to help and contribute to the achievement of the objectives of the Exquisite Quality. This is part of his performance improvement plan. Depending on the expectations, it is then possible to deploy in the organization a whole range of more or less complex tools (ranging from 5S to 6sigma methodology).

Thus thanks to M0411 - Diagnostic Tools, it is possible to identify tools, or principles, of Lean Management that could both "coexist" with the SMQ, and allow to obtain the Quality of products and / or service. It is then possible to study the opportunities for implementing Lean Management tools (A041). Following this opportunity study (S0411), it is possible to choose to implement Lean Management tools (A042), depending on the business strategy (M0421), and the selected tools (M0422).

Tools: All the tools of Lean Management naturally find their place in this phase (5S, Kanban, 6 sigma, ...). In the case of an organizational improvement plan, we can also use the audit. It is also possible to use the Stress Test organisational presented by the following in this memoir, which is an innovative approach in the field of Quality.

Intermediate Deliverable: The Opportunity Study identifies and selects the most appropriate Lean Management tool in relation to the improvement plan theme.

Deliverables: It is not easy to identify "real deliverables" at this stage, because we are dealing with a conceptual definition of Quality (the ability of a set of intrinsic characteristics of an object to meet requirements). We could therefore identify the satisfaction of the actors.

Visual communication

To be able to implement the QMS and obtain the support of all the staff, it seems to us essential to use visual communication. We propose the following definition of "Visual Communication" Visual Communication at all levels of the company by communication points using spaces dedicated to

communication (display, internet terminal, ...), and applying a vision "Lean ", i.e the least document possible. We propose to explain this phase based on the requirements of the ISO 9001 standard.

S031: We use the operating QMS coming from A03 - Design of the Continuous Improvement Process.

S051: the QMS is communicated and implemented throughout the company.

Objective: The "Visual Communication" of the organizational system is simplified to the extreme so that all employees find the right to understand and apply the operational requirements of the standards.

Explanations of the different steps: All the classic tools of visual communication, for example: display point, dashboard, ... can be used during this step. One book deals with these tools, it is Greiff's "Usine affiche"¹⁶.

QMS animation

The system cannot be static and not animated, it is necessary that one or more resources are dedicated to its animation.

We propose as a definition of "QMS Animation". Animation of the QMS by a dedicated resource that has been previously trained, and which systematically drives the operational QMS of his company. We propose to clarify this phase by relying on the requirements of the ISO 9001 standard.

S031: We are using the operational QMS from A03 - Continuous Improvement Process Design.

S061: An internal human resource can handle the QMS.

S062: The QMS is understood and applied by all the staff of the company.

Explanations of the different steps: We propose to train an internal resource of the company (A061), so that it appropriates the QMS (in particular if it was not supported during the implantation milestones of a standard that we present later), and that it is able to animate it during the everyday life of the company. This trained resource can then sensitize all collaborators (A062), using visual QMS (S051). In some companies (especially VSEs / SMEs), it is sometimes not necessary to create a QMS animator. This function is then assigned to a cross-functional function such as Human Resources Manager or Administrative and Financial Manager.

Tools: We can use the audit (or Organizational Stress Test), training, coaching, to help this resource to take the role of QMS facilitator.

Deliverable: The QMS is then exploited, animated and understood by all the staff of the company. This is the primary goal of any successful implementation of a standard.

IMPLEMENTATION OF THE LEAN APPROACH STANDARDIZATION

We propose in this part to describe the organization implemented to obtain a certification, and to animate a QMS, then the mode of deployment (in the form of project milestones) of our model.

The organization of the company for the implementation of a QMS

Generally, a company seeking certification, adopts a pyramid organization of its Quality department (Figure 5). This is usually composed of a Quality Manager attached to the Management, and correspondents integrated into all departments of the company. To support this organization, two bodies are important: the Management Review and the Steering Committee. The Management Review decides on the effectiveness of the organization, while the Steering Committee verifies that the processes are moving towards the objective that has been assigned to them. We suggest driving the Steering Committees according to the Hoshin method dealt with in Chapter 2 of this memoir. To be able to work properly the COPIL relies on process drivers. These pilots can also use identified correspondents to successfully execute the processes in an operational way.

The Quality Structure

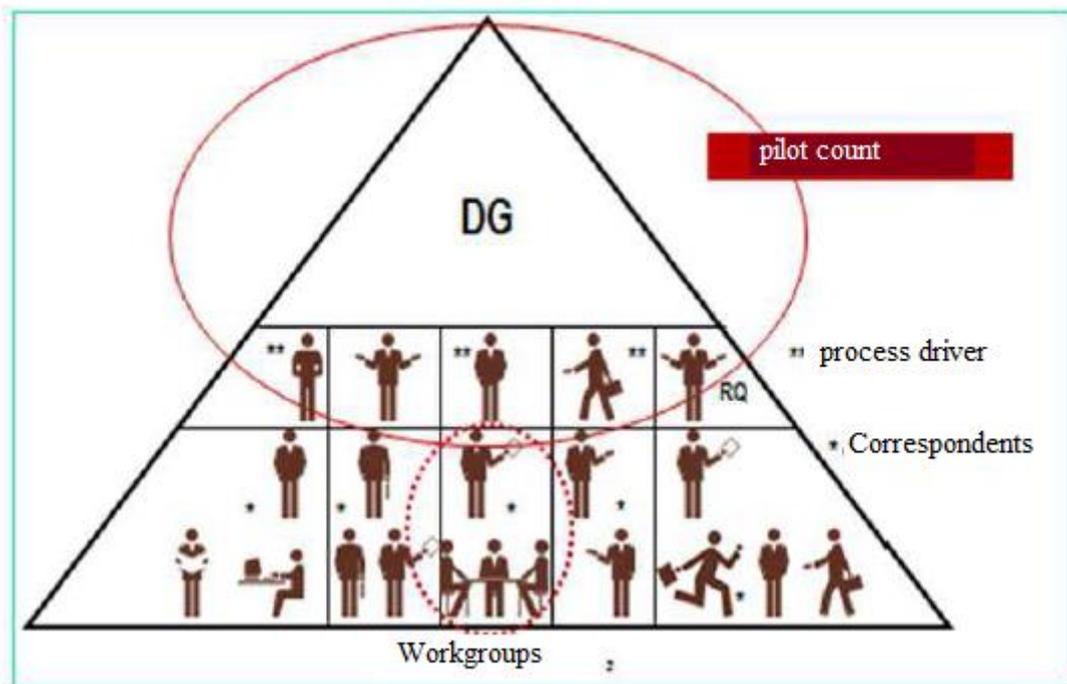


Figure 5: The pyramidal organization of Quality.

Project mode deployment

As part of the application of our model, we have proposed to companies its deployment by respecting several Milestones. We then proposed an implementation according to the following schedule:

A01 - Muda Documentary:

Preparation in advance of the identification of normative documented requirements

A02 - Just Documentary:

- Milestone 1, Implementation of the draft Quality Manual with flowchart, function definition and process mapping (with process identity card), verification of DSM management policy (control equipment, measurement, and testing) ,
- Milestone 2, Implementation of document management procedures and audit management,
- Milestone 3, Implementation of Corrective and Preventive Action Procedures and Nonconformity Processing, Customer Satisfaction Survey,
- Milestone 4, Establishment of mandatory records of the standard (19 in V2008, 23 in V2015) in partnership with Management, Quality, HR, Production, Engineering, Maintenance and Purchasing (NB: several functions can be held by the same person),
- Milestone 5, Awareness of all staff to the implementation of Quality Assurance, field diagnosis and training,

A03 - Improvement Process Design:

- Milestone 6, Establishment of the management bodies of the QMS: COPIL (Steering Committee of the processes) and review of Management, First Report Render of these two instances (study possibility of merging them),

- Milestone 7, Establishment of the permanent improvement and quality monitoring files, beginning of information of the database of the improvements,

A04 - Exempt Quality:

- Milestone 8, Blank Audit,
- Milestone 9, Second Management Review, update of Quality Management System (QMS) records and files,

A05 - Visual Management and A06 - Man Management:

- Milestone 10, Removal of gaps.

All the companies that have applied our model have been certified to date, without any discrepancies during certification audits. Since the certification audit is an independent process, we can consider that our model is sound and relevant because of its certification results. Our model has been deployed in the few famous companies. For each of them, the principle of the 10 milestones mentioned above, and associated with our models, was scrupulously followed and spanned over periods covering from 2 to 3 months. Some difficulties were encountered, such as the scepticism of managers faced with a strong simplification (proof that the image of ISO was deteriorated) and some functions "recalcitrant" to change.

Conclusion

At first, our work allowed to make a bibliographical analysis of the research works on Lean Management. A finding seemed then obvious and important for the continuation of our work: the implementation of the continuous improvement in the companies is based either on ISO, or on the concepts of Lean Management. This implementation did not exploit in a positive and combined way the advantages of these two approaches. With this in mind, we have sought, through a modelling approach, to synergize the main concepts of Lean Management and the normative system of the ISO type. We have called this "Lean Normalization" approach: it corresponds to the implementation of a standardized system by associating it with the concepts of Lean Management. The proposed Lean Normalization approach is based on the following six main concepts: Muda Documentary, Documentary Fair, Continuous Improvement, Perfect Quality, Visual Management and Man Management. The implementation within a company takes place according to a project approach in ten milestones. Our "Lean Normalization" approach has enabled several companies to obtain ISO 9001 certification in a short period of time, and with an "efficient" efficiency of the quality management system. This synergy between the two approaches has finally been possible thanks to a simple, efficient and low cost model of compliance of an organization. We find then the triptych dear to the quality and the Lean Managers, of: Quality, Cost, and Delay (to do well, quickly and at low cost). Future work may focus on the agility of the model with other standards (ISO 18001, ISO 45001, TS, EN, etc.) allowing a successful implementation in various fields and companies wishing for a convincing certification. A complementary area of research to be developed in the future concerns the sustainability of organizations that have adopted our model.

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