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The Moderating Role of Organizational Structure Between Quality Management Systems and Organizational Resilience

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ABSTRACT

Purpose: To realize the benefits a Quality Management System (QMS), an organization needs to effectively implement its principles. This includes embracing these principles within an enabling environment. Hence, organizational structure is a critical success factor for adopting quality management systems. This paper aims at understanding how the organizational structure impacts ISO 9001 QMS implementation and vise versa, besides exploring how quality management initiatives affect organizational resilience through parts. **Design/methodology/approach:** The research deploys a qualitative methodology, with an outsider-insider approach. 32 semi-structured interviews were conducted, plus one final reflective interview. Interview questions dealt with structural constructs: communication, employee engagement, employee empowerment, process/routine-orientation, multidisciplinarity, cross-functionality, expertise-utilization and change-readiness. The questions also dealt with how the organizational structure impacted ISO 9001 implementation and vice versa. **Findings:** The results show that ISO 9001 implementation was more successful and fruitful under process-orientation and to some degree under semi-process orientation, while it looked inconsistent under routine-orientation. This indicates a significant role played by the organizational structure when it comes to ISO 9001 implementation. More importantly, the results also demonstrate that ISO 9001 implementation managed to improve organizational resilience by consistently driving the organizational structure toward higher levels of process-orientation for process-oriented units, whereas it failed to realize such impact for routine-oriented units. **Originality/value:** This study is unique as it is the first - within the reviewed literature - to examine the moderating role of the organizational structure between the ISO 9001 standard and organizational resilience. It draws a roadmap for the successful realization of organizational resilience through quality management systems, considering organizational structure constructs.

KEYWORDS

Organizational structure; Process-orientation; Routine-orientation; Quality management system; ISO 9001; Organizational resilience

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1. Introduction

To realize the benefits of ISO 9001, an organization needs to effectively implement the standard. This entails the implementation of the quality management principles the standard embraces, within an enabling environment. Hence, organizational structure is a critical success factor for any organization, where flat structures (process-oriented) bring in multiple benefits. They emphasise outcomes rather than functions and create environments with enhanced communication all over the structure as barriers between the different units are eliminated. Under flat structures, employees are empowered to make decisions. Education becomes key to create a multidisciplinary and efficient staff. Change is integral with staff encouraged to introduce new incremental or breakthrough improvements. Managers should become coaches helping employees to improve and overcome problems. Top management should embrace leadership within an open-minded environment where all are involved and engaged. At the same time, process-orientation requires continuously responding to evolving demands.

On the other hand, the ISO 9001 standard promotes several features within an organization. It is centred around process-thinking, where a certain work is identified as a process with stakeholders and plans specified. The standard stresses continuous improvement, with the PDCA cycle being the core concept for the pursuit of continuous improvement all over the organization. Both training and education are essential in the standard as quality techniques and methods, besides work skills should be instilled in employees. ISO 9001 requires involvement and empowerment of people. People are involved in planning, execution and evaluation. Decisions are delegated for less bureaucracy and centralization. Add to that, suppliers and customers are engaged for better planning and outcome. However, this should be done within an environment where communication is promoted in all directions, and Cross-functionality[1] and teamwork are nurtured among the staff. This might entail a culture change to overcome traditional perspectives of competition for promotion.

It is assumed here that higher process-orientation provides a better environment for the realization of ISO 9001 benefits. This is increasingly important when dealing with difficulties for quick intervention is vital. With the current literature yet to explore the role of organizational structure in enabling effective implementation of ISO 9001 for organizational resilience, this paper examines how the organizational structure enables/disables effective implementation of ISO 9001 for organizational resilience. For this purpose, the paper explores the literature on both organizational structure and ISO 9001, shedding light on the intersections between the two. It also engages in semi-structured interviews to collect inputs aiming at understanding the relationship and find out how the organizational structure impacts ISO 9001 implementation.

2. Background

2.1. Organizational Structure

Organizational structure concerns the assignment and division of roles within organization, and the interactions between horizontal and vertical groups (Gulati and Puranam, 2009; Jarzabkowski et al., 2016). With the evolution of organizational theory, organizational structures have also evolved over time. This part addresses in further details two organizational structures, routine-based and process-based structures.

2.2. Routine-oriented organizational structure

Champy and Hammer (1993) point that routine or organizational routine was first introduced by Edwin O.

[1] Cross-functionality refers to deploying people from different functional expertise towards a unified goal.

Stene in 1940, who defined it as the "part of any organization's activities which has become habitual because of repetition and which is followed regularly without specific directions or detailed supervision by any member of the organization". Stene indicates that no perception is required as tasks are performed habitually in a more mechanical manner, yet even routines involve a certain amount of awareness. For instance, Safavi (2021) asserts individuals performing routines have different understandings regarding these routines. Cyert and March (1992) introduce three possible outcomes for routinization or proceduralization: avoidance of uncertainty, preservation of rules and maintenance of simplicity. Gersick and Hackman (1990) propose that routines are characterized by: 1) repeatability, 2) similar functionality, 3) pattern of behaviour and 4) a given situation. Furlan et al. (2023) claims that one effective way to replicate routines across organizations is employee mobility.

Stene (1940) argues that routine does not hinder initiatives and mental efforts since a worker to become creative in his/her work, s/he needs first to master the practical dimensions. He thinks organizations may adapt to new routines (change) in their pursuit of organizational objectives. Thompson (1967) and Nelson and Winter (1982) indicate that proceduralization is a source of stability for an organization adding that routines play an important part in the acquisition of knowledge and skills in the organization as people learn by doing. They also argue that routine is important to have control over processes by keeping the production processes homogeneous.

Gersick and Hackman (1990) indicate that routine behaviour is a source of efficiency. Follett and Graham (1996) argue that proceduralization contributes to the overall good of the organization, despite compromising individual benefit in some cases. In a case study by Adler et al. (1999), routines are found to facilitate efficiency in the performance of nonroutine activities at Toyota. The organizational structure also proved important in facilitating parallel work on both routine and nonroutine work in different units. It is worth noting that in the Toyota way (Lean), routines are patterns that involve high level of awareness both at the individual and group levels. Additionally, Lim and Moon (2021) emphasize that a routine-based organizational structure promotes clarity, internal visibility and predictability in operations.

On the other hand, Stene (1940) warns that routine does not always promote coordination of activities. It is also limited to regular repetitive activities, for they are more likely to be useless during abnormal situations. Nelson and Winter (1982) explain that routines might hinder flexibility and change with proceduralized behaviour becoming inherent. They also cannot be applied to all organizations, for example, R&D firms which are change-centred. This means a change in a machine or behaviour might take longer time to be acquired due to resistance. Davenport (1993) indicates that procedure-orientation lacks cross-functional and cross-organizational attributes, making the flow of information within the system ineffective and inefficient. Champy and Hammer (1993) suggest that US procedure-based firms lacked flexibility, responsiveness and customer focus, which gave Japanese firms like Mazda the upper hand against US firms like Ford. A 1984 conceptual study by Hannan and Freeman (1984) concluded that routine causes structural inertia, minimizing firms' ability to survive when faced by adverse conditions or difficult times. Yang et al. (2022) warns that due to routines, the organizational structure may hinder organizational learning.

2.3. Process-oriented organizational structure

Benraad et al. (2022) explains that organizations establish processes to both realize their operational goals and comply with legislations. Hammer (1996) demonstrates that process-orientation 'reversed' the industrial revolution by putting the parts the revolution decomposed together again. Hinterhuber (1995) reveals that in process-orientation, suppliers and customers are involved through a horizontal organizational structure that enables open communication. Process-based structures are cross-functional and centred around the outcome, where employees are empowered to handle a complete transaction. According to Champy and Hammer (1993), under process orientation 1) work units are replaced by process teams, 2) jobs become multidimensional, 3) people

are empowered to make decisions, 4) education replaces training, 5) focus is shifted from activity to results, 6) advancement becomes based on ability rather on performance, 7) productive values replace protective values, 8) managers become coaches not supervisors, 9) flat organizational structures replace hierarchical structures, and 10) executives embrace leadership. Hertz et al. (2001) performed a case study on Volvo's strategy. The adoption of the process-oriented structure improved sales, market share, profitability, lead-times, delivery precision and customer satisfaction.

On the other hand, Champy and Hammer (1993) claim that 50% to 70% of the organizations that undertook redesign toward a process-oriented structure failed in the early 1990s. Hammer and Stanton (1995) believe the high figures of failure reflect the difficulty of moving to the emerging process-oriented approach. Perhaps the main source of failure has been ignoring the social aspects in the transformation. Vanhaverbeke and Torremans (1999) argue that processes cannot be the only basis for organizational structures, pointing that functional skills and product/service management are integral also. Added to that, not all activities undertaken within a system can be aligned with the process approach. Hammer (2007) admits that the process-orientation journey is hard and needs huge efforts. Silvestro and Westley (2002) find that process-orientation brought in some negative effects, namely, replication of expertise, increased complexity, higher costs, horizontal silos, inconsistent functional decisions, and declined efficiency of the operations network. As for the time being, there is a consensus among quality practitioners that process-orientation is key for successful implementation of QMSs (De Feo, 2017).

2.4. ISO 9001 Structure

From the very beginning, the quality movement has been constructed around process-thinking. Edwards Deming, the father of quality, emphasized in his 14 points both continuous improvement, involvement of people, education, communication and cross-functionality (Deming, 2013). Another prominent quality guru, Joseph Juran, embraced similar principles highlighting the need for communication, continuous improvement and training in his famous trilogy (Quality Planning, Quality Control and Quality Improvement) (De Feo and Juran, 2012). Philip Crosby, the developer of the zero-defect concept, also stressed cross-functionality, training, education, communication, continuous improvement and involvement of employees (Crosby, 1979). Armand Feigenbaum, who first introduced Total Quality Control, affirms that involvement of employees, teamwork, continuous improvement and engagement of customers and suppliers are essential for quality management (Feigenbaum, 1983). The Japanese quality guru, Kaoru Ishikawa, emphasizes process-thinking in his approach to quality, endorsing continuous improvement, employee empowerment, communication and cross-functionality (Watson, 2004; Goetsch and Davis, 2014).

Seddon (2000) and the British Assessment Bureau (BAB) (2016) agree that the first two versions of the ISO 9001 standard started as inspection tools leading to high levels of bureaucracy as the focus was control within certain types of organizations, mostly manufacturing. Firms needed to prove that they did what they said. This led to large amounts of documentation that turned into a burden. The 2000 issue of the standard was a major review refocusing the standard to better respond to the needs of organizations as a tool for improvement. It reduced documentation and centred the standard around process-orientation. Continuous improvement became a main principle of the standard, beside involvement of people and engagement of partners. Also, prevention of problems replaced the traditional corrective approach within the previous version. These all are core in the quality management movement and represent the main principles of the process-oriented organizational structure. The next two reviews, though not big, further pushed the standard toward process-orientation. West and Cianfrani (2016) and the American Society for Quality (ASQ) (2016) point that the most interesting thing in the ISO 9001:2015 version is the explicit introduction of risk-thinking.

3. Case study

In its quest to examine how the organizational structure impacts ISO implementation, the paper deployed a qualitative approach with an inductive strategy. The study examined the Oman Ministry of Education (MoE), the public entity responsible for school education. MoE manages all aspects related to schooling from grades 1 to 12, including allocated public funds. Data was collected between January and May 2018 at MoE's headquarters in the capital Muscat. 32 semi-structured interviews were conducted, plus one final reflective interview in Jan 2019. Semi-structured interviews were chosen so comparability and in-depth investigation of evolving topics were possible. Interview questions dealt with structural constructs: communication, employee engagement, employee empowerment, process/routine-orientation, multidisciplinarity, crossfunctionality, expertise-utilization and change-readiness. The questions also dealt with how the organizational structure impacted ISO 9001 implementation and vice versa. MoE was ISO 9001:2008 certified in 2014, while data collection coincided with the transformation to the newer version of the standard, ISO 9001:2015.

4. Analysis and Results

4.1. Participants' profile

The majority of participants were males [24], while females represented a quarter [8]. In relation to years of experience, the minimum was 6 years while the maximum was 32 years. 30 participants had more than 10 years of work experience in MoE. Job titles within MoE are classified under three main categories: 1) executive employees (first line) of whom 14 participated, 2) supervisory employees (middle management) of whom 16 participated and 3) top management personnel of whom 2 participated. Hence, respondents constitute a good representation. In terms of within-organization units, participants came from two DGs (DG1 and DG2) equally. Purposive sampling was employed to gather a sample of people who had both witnessed the implementation of the ISO 9001 standard (often referred to here as ISO or standard) from the very beginning and were familiar with the difficulties MoE had been through before and after the implementation. Unless stated otherwise, proportions refer to these totals.

This research implemented an insider-outsider approach (Louis, 1981: Gioia et al., 2010); hereafter, data analysis[2] was conducted over two separate periods. In the first phase, participants' responses were analysed and interpreted to find answers to the research question. In the second phase, with the final interview finished, initial results were examined once again against the insights obtained from the reflective interview. The aim was to provide an inner knowledgeable voice to validate the findings of the analysis and have a holistic view to the context. The Director-General, referred to here as 'informer', commented on the results and findings of the study. The informer was selected based on his direct involvement in the planning, execution and evaluation of the quality management system, besides being there in a senior position for nearly a decade.

4.2. Role of organizational structure

4.2.1. Communication

Out of 31 responses, the majority [24] confirmed that communication within their units was horizontal. They showed that communication was smooth with no barriers obstructing it in all directions, with a participant explaining that a main feature was the absence of a gap between the different levels of job ranks. A notable repeated remark was flexibility in communication methods as participants pointed to the use of the online platform and

[2] Analysis started with comparing individual responses (based on job titles and ranks); however, this yielded disconnected and inconsistent results. Thus, analysis moved to comparing Departments and DGs.

emails beside other means. Participants explained that communication increased work effectiveness, improved employee satisfaction and added value to work. Some participants specified that because their units were teamwork-based, communication flourished. One final observation was introduced by a participant, who showed that communication flows both through formal and informal networks. The use of informal networks reflects the importance of social relationships in task accomplishment and indicates that social considerations may drive the effort, not organizational motivations.

In contrast, 7 participants believed that communication was vertical within their units. They attributed it to the organizational structure. A participant highlighted the presence of a gap between first line employees and top management. Examining the data by DG showed that DG 1 looked far more horizontal, in terms of communication, than DG2 with 14 from DG1 indicating so (almost a consensus) in comparison to 10 from DG2. The informer commented on the difference between DG1 and DG2 in terms of the flow of communication saying: *"I think the difference between the two Directorate-Generals is attributable to workload in the Directorate-General of Administrative Affairs [DG2] … I have no idea about the relationships in their environment though"*.

4.2.1.1 ISO Impact

Most participants [20/32] perceived ISO implementation to have positively impacted communication within their work environments. First, the standard ensured leadership's commitment, which added more power to communication leading to improved performance. This somewhat narrowed the gap between the top and bottom of the organization. Similarly, participants revealed that by engaging people, ISO enhanced communication. The standard improved communication speed since it involved timeframes (indicators) and follow-up. Another group thought ISO improved organization and visibility, making sure communication paths are well defined and clear. Some participants indicated that the standard shifted communication toward improvement adding value through a fact-based approach. An interesting point was raised by a participant who expressed that ISO implementation contributed to moving from the vertical to the semi-horizontal organizational structure, which improved communication. Finally, some participants believed that ISO implementation promoted better integration between organizational units.

On the other hand, [12] participants considered ISO implementation to have had no impact on communication with two main lines of thoughts observed. The first group considered the standard irrelevant believing it only focused on work procedures and compliance. The other group perceived no impact because their units had had the same flow of communication even before implementing ISO. Looking at data by DG showed that equal responses form the two DGs perceived positive effects for ISO implementation. The same applied for responses indicating no impact. However, among the 12 people believing the standard had no impact on communication, those indicating their units had always had the same communication flow came from DG1, while those considering the standard irrelevant or a task came from DG2. This demonstrated a difference in conception regarding the standard. The informer confirmed the key role ISO played, showing it was one of the main goals for the implementation: *"communication is one of our goals in the quality system. The high level of communication has been existing for a long time, but now it is based on the principles of quality. It has become a task and work requirement"*.

4.2.2. Employee engagement

28 respondents indicated that their units engaged employees in the different aspects of work, with most prominent area for engagement being planning, beside execution. Interestingly, some responses pointed to the fact that employees could shape the decision as they were engaged in the provision of consultation and feedback, which is crucial in the context of risk management. In relation to problem solving, employees played a similar role by providing facts and evidence-based solutions. Some participants indicated that although engagement was actively

observed, it was determined by three main factors: nature of work, employee's competency and role of management or leadership. It is worth noting that engagement worked as a closed-loop dynamic, where certain issues were deferred to employees from top management to examine and provide potential solutions, which were then raised back to top management. At the same time, feedback and proposals were raised by employees to top management to approve and then send back for adoption.

In contrast, only 4 people believed engagement was not present in their units, referring that to hierarchy and management style, which determined whether people could be engaged. Examining results by DG showed little difference as 15 from DG1 said their units engaged employees in comparison to 13 from DG2. Again, the informer explained that employee engagement was one of the goals for the ISO implementation: *"engagement is a goal we have been pursuing over recent years. We managed to realize it and now we look forward to implementing deeper practices"*.

4.2.2.1 ISO Impact

Out of 30 responses, more than half [17] believed ISO implementation had had positive effects on engagement. The first impact was contextualising engagement within the formal structure as a requirement. This was achieved by obliging engagement and providing formal mechanisms to ensure implementation. The standard also had impacted by encouraging wider participation. Responses showed that this applied also to problem solving and provision of feedback and innovation and highlighted the role of recognition by the ISO report. The latter was perceived by employees as an incentive for more engagement. Another important impact was visibility, which in turn produced organization, timeliness, assignment of roles and accountability.

On the other hand, 13 people thought the standard had had no impact on engagement within the work environment due to two causes. The first group mentioned that their units had always been engaging employees even before implementing ISO, while others hinted that the standard did not affect engagement because it was not implemented across the whole organization. Some even pointed to a difference between reality and policy ('decoupling'). In general, the impact of ISO seemed to be partial. Investigating results by DG showed some difference. 10 from DG1 believed ISO implementation introduced positive effects, in comparison to 7 from DG2. Similarly, 5 from DG1 thought ISO did not have any impact, in comparison to 8 from DG2. It was noticed that most of the responses from DG2 pointed to inadequate implementation of the standard, whereas the majority of responses from DG1 explained that engagement was part of their culture before implementing the standard. Regarding ISO's impact, the informer revealed that the system was one of the causes leading to more engagement: *"ISO is one of the causes of this conviction as it emphasizes that employees should handle everything"*.

4.2.3. Employee empowerment

Out of 32 respondents, only 9 believed employees within their units were empowered to make decisions. This group attributed it mainly to visibility, which according to them made the decision-making process clear and straightforward. Some participants pointed to the nature of decision as a key factor. Authority could be delegated when the decision was at the section or departmental level, while at DG level in most cases delegation was not possible. From the alternative viewpoint, 23 participants articulated the absence of empowerment within their units. Most of this group noted that their role ended after drafting the decision. Responses proposed a number of reasons behind the absence of empowerment. First, accountability and fear of consequences were the most prominent deterrents as both directors and employees seemed to avoid accountability. Another perspective related it to the nature of work. One group indicated the presence of barriers that obstructed empowerment, which seemed to originate from the organizational structure itself. An interesting point was raised by one participant who further disentangled visibility into horizontal and vertical, with good visibility occurring horizontally and even vertically,

yet vertical visibility was one-sided, top-down. In other words, top management was aware of what was going at the bottom, while employees were not quite sure about what was going at the top. One participant resisted empowering employees, stating it could lead to chaos.

No difference was observed between the two DGs, except it seemed people in DG1 were more aware of the importance of empowerment and looked forward toward achieving it, while people in DG2, despite being aware of the absence of empowerment, did not look at it as an important factor. Although the informer agreed on the absence of empowerment in decision-making, he perceived employees' engagement in strategic planning as empowerment: *"decision-making is still out of our reach… When it comes to school buildings, the employee is somewhat empowered. He prepares a 5-year plan worth of half a billion Rials…"*.

4.2.3.1 ISO Impact

When looking at the impact of the standard on empowerment, 12 out of 31 responses perceived positive impacts. One important impact was introducing a mentality shift. The second and most repeated impact was improved visibility, which had led to the third impact, which is ownership of process or work procedures. This enabled distributing responsibility and accountability to process owners. Some participants believed that because ISO required more engagement, empowerment had been adopted in a wider scope. The last impact came through capacity building, which according to a participant would lead to empowerment. On the other hand, 19 participants said that they observed no impact for the standard on empowerment. Although not much explanation was provided, organizational hierarchy was perceived to be the main reason. Similarly, the work environment seemed to be heavily blame-based, as people focused on responsibility avoidance. A third perspective attributed it to individual differences, where both differences in management's perspectives and employees' personalities played a role in whether authority was delegated or not. Many participants thought ISO did not impact because it was irrelevant.

A detailed examination of results by DG showed that more respondents from DG2 than DG1 found ISO to have impacted empowerment positively, 7 to 5. Similarly, more people from DG1 thought the standard had no impact on empowerment than from DG2. It was noted that more responses from DG2 felt ISO irrelevant considering it either a formality or a personal issue - implementation depends on people's personal attitude -, while more people from DG1 thought ISO's lack of impact came from the system and culture. Unlike employees' responses, the informer suggested that ISO implementation did empower people: *"ISO implementation generates empowerment naturally. The moment the system is implemented, it empowers employees"*. However, since the informer perceived engagement as a kind of empowerment (see previous section), the input remained vague.

4.2.4. Nature of work (Process-/Routine-orientation)

When asked about the type of work performed by their respective units, 20 out of 31 respondents indicated their units performed process-oriented work. The responses demonstrated attributes resulting from following process-orientation. The first noted feature was visibility, which controls the rhythm of work within the organization, and seemed also crucial for better control over workflow. Responses also indicated that process-orientation promoted engagement and teamwork. An important aspect was presented by a participant who believed that documentation helps monitor and improve performance. Participants also noted that their work did involve some routine-based activities, which depended on the goal. Alternatively, 11 participants described their work to be routine-based. Here, the environment exhibited several characteristics, including specialization, showing that improvement was nothing more than updating the current routines. At the same time, responses pointed to the absence of innovation.

Breaking down data by DG showed a big difference between DG1 and DG2. For DG1, employees unanimously demonstrated process-orientation within their units, while only 4 (around a 1/4) from DG2 indicated so. In relation

to the difference between DG1 and DG2, the informer associated that to the nature of work: *"the difference can be due to the nature of tasks and work; for example, appointment and transfer [from DG2] are routines"*.

4.2.4.1 ISO Impact

Out of 32 responses, 21 suggested ISO implementation had positively impacted the nature of work in their units. The first group said that the current level of process orientation, or reduced level of routine-orientation, was because of the standard. Similarly, participants attributed organization in the work environment to the standard, besides improved visibility and continuous improvement. One impact was ensuring consistency in terms of role and responsibility assignment. Finally, even those who ensured their units were routine-based witnessed some improvement as routines were updated and organized.

The remaining participants [11] believed the standard did not affect the nature of work. First, respondents thought ISO was irrelevant since it was about compliance to standards. The other group believed change was not possible because ISO fixed the situation, making the routines obligatory since auditing was performed to check compliance. A third perspective attributed the absence of impact to the fact that the implementing DGs (DG1 and DG2) had to work with other DGs and bodies that did not implement ISO. This meant control could not be exercised throughout the whole chain. The last group said no effect was observed because their units had already been process-oriented before ISO implementation.

Examining results by DG showed no notable differences. However, among those indicating the standard had no impact on the nature of work, the majority of those considering ISO irrelevant or had contributed to fixing the routines came from DG2. On the other hand, those who credited it to being already practised before ISO implementation came from DG1. Interestingly, the informer revealed that the shift toward process-orientation was a planned objective for the implementation of ISO: *"... we studied different systems and realised that organizations implement ISO as a transition. Therefore, we selected ISO. We recognized this [improved process-orientation] from the very beginning ...".*

4.2.5. Multidisciplinary Behaviour

When talking about multidisciplinary behaviour, 28 respondents indicated that their job either encouraged or required this aspect explaining it added value to the organization, including enhanced variety (richness). Others believed multidisciplinarity enabled better internal mobility and enhanced self-organization. This eradicates the need to wait for support from another unit which might come late. Finally, with richness and self-organization came improved resilience. Some participants believed management played a key role in facilitating multidisciplinarity. On the other side, some responses thought multidisciplinarity depended on the employee her/himself. Another group admitted that multidisciplinarity was an advantage, but thought it added a burden to employees. This seemed the reason for some resistance among employees.

In contrast, only 4 people described their units to be monodisciplinary with people doing the same procedural work. Looking at data by DG illustrated that DG1 was perceived multidisciplinary by all its participants [16], while 12 from DG2 thought the same (less by 1/4). The informer showed that multidisciplinarity had become a work requirement: *"this is an ISO 9001:2015 requirement which addresses risk and knowledge, both explicit and implicit. Employees have been moved from a position to another..."*.

4.2.5.1 ISO Impact

From 29 responses, only 8 said ISO implementation had had positive impacts on multidisciplinary behaviour. The main argument was that ISO, through knowledge management, enhanced multidisciplinarity. According to a participant, ISO played a role in improving self-organization, which resulted in wider expertise. Another group

praised ISO for augmenting visibility, facilitating easy location of expertise. Others argued that ISO introduced a mentality shift. In contrast, 5 people perceived negative effects for the standard on multidisciplinary behaviour. According to this group, ISO limited multidisciplinarity as it emphasized alignment between qualification and job title. The rest of participants, who were the majority, believed ISO had had no impact on multidisciplinarity. The respondents presented two main thoughts here. The first group looked at ISO as irrelevant since it only dealt with compliance, while the second considered multidisciplinarity a management issue with the person in charge (e.g., director) capable of harnessing this aspect.

A close look at the results showed that more participants from DG1 thought that ISO had positively impacted multidisciplinarity, 6 for DG1 and 2 for DG2. The figure improved slightly for DG2 when considering the ISO 9001:2015 version from 2 to 3. Still, they were half the number of those from DG1. 4 people from DG2 believed ISO had negative effects on multidisciplinarity in comparison to 1 from DG1. Almost the same number of respondents thought there was no impact for ISO on multidisciplinarity, 8 for DG1 and 7 for DG2. The figure improved for DG2 with the latest version of the standard. Overall, ISO seemed to have no effect on multidisciplinarity within MoE. In contrast, the informer thought ISO had affected multidisciplinarity, particularly with regard to knowledge accumulation and location: *"ISO plays a role through access as everyone can see the performance level through results, including the beneficiary. ISO has organized knowledge management"*.

4.2.6. Cross-functionality

29 participants ensured that cross-functionality was exercised in their units, revealing that the financial difficulties reduced the number of cross-functional teams. The decreased dependence on teams was most likely due to their cost, whether direct or indirect costs (e.g., remuneration and working hours). Another group indicated that cross-functionality was a requirement, while others thought that cross-functionality was utilised based on the nature of work. In terms of advantages, some viewed cross-functionality as a capacity building mechanism as teams facilitated access to information and expertise and enriched employees' knowledge. On the other hand, some participants believed that cross-functional teams caused delays, which might have been related to the absence of 'meeting management' as others indicated the opposite.

In contrast, 3 participants pointed that cross-functionality was not exercised in their units, believing it was not required in their work. In fact, 2 out of the 3 respondents opposed cross-functionality. Examining results by DG showed little differences as all participants from DG1 ensured cross-functionality was common within their units, in comparison to 13 from DG2. The informer acknowledged the practice of cross-functionality, though seemed to be to some extent opposing it: *"cross-functional teams do exist, but I prefer work through functional units because it ensures continuity, grows employees intellectually and avoids overlooking them…"*. It was unclear why the informer thought cross-functionality hindered employee growth, which is highly debatable.

4.2.6.1 ISO Impact

From 29 responses, as many as 12 believed ISO implementation had positively impacted cross-functionality. This was perceived in different ways with the first being encouraging cross-functionality. Others indicated that the standard organized cross-functionality by ensuring that the relevant parties were included in teams. Others argued that by improving visibility, ISO had put more emphasis on cross-functionality. A participant who criticised teams for delaying work, clarified that the standard improved cycle times in cross-functional teams by setting time schedules, indicating that ISO tuned performance. The last advantage mentioned by participants was recognition. It seemed participants looked forward to having their teamwork recognised in the ISO report.

In contrast, only 1 participant believed ISO had negatively impacted cross-functionality by emphasising specialization. On the other hand, more than half of the responses indicated that ISO had had no impact on cross-

functionality. Some thought the standard was irrelevant, whereas others referred to the absence of impact due to the limited scope of the standard, which covered only 2 DGs. The last group looked at the standard as a formality, which did not change anything.

Closely looking at the results showed that the standard had partly impacted cross-functionality, with DG1 being slightly more positively impacted than DG2 (7 in comparison to 5). Similarly, no participant from DG1 raised any negative effect, while 1 from DG2 did so. For those who said no impact was observed, those coming from DG1 hinted they had always incorporated cross-functionality in their work even before implementing ISO. The informer agreed that ISO did not play any role here as it was not a focus for the system: *"ISO has not played a clear role here in internal and external audits. We have just started realizing our final goal, continuous improvement"*.

4.2.7. Expertise-utilisation

Most participants [20] suggested that their units utilised expertise to a great extent; some described it as perfect. Responses indicated that expertise-utilisation was cross-sectional in the whole organization, indicating that expertise-utilisation provided variety in views and access to information which facilitated decision-making. Others pointed to expertise-utilisation during difficult times. Participants also talked about the role of expertise-utilisation in training and knowledge transfer.

On the contrary, 12 respondents complained about the absence of expertise-utilisation within the organization and showed how this led to the loss of key employees. Another perspective pointed to monopoly by seniors who gave no space for others and exclusively practised power. Others referred to these practices as management style, explaining that some managers or leaders considered utilising expertise while others did not. In general, no differences between the two DGs were observed. Yet, responses from DG1 engaged in discussions related to the role of management, knowledge transfer and risk management, while respondents from DG2 talked about expertise-utilisation as a procedure of referring to a colleague for information. The informer explained that the organization sought to maximize employees' conviction of worth through utilization of their expertise: *"this is based on conviction and the organization should maximize employees' conviction through promoted communication"*.

4.2.7.1 ISO Impact

From 31 responses, 13 perceived ISO implementation to have had positive impacts on expertise-utilisation. The main effect was thought to come from the introduction of knowledge management. Others believed that ISO, via employee engagement, improved expertise-utilisation for when employees are engaged, their capacities are exploited. Similarly, Participants indicated that training requirements imposed by ISO resulted in better expertise and then utilisation. One participant pointed to recognition by the ISO report as an effect enhancing expertise-utilisation. Since the report praised such practices, it seemed management was trying to better integrate expertise-utilisation. One of the main effects of ISO implementation was consistency of performance, which respondents believed had positively impacted expertise-utilisation. This was particularly relevant to self-organization measures the standard required. In contrast, 18 respondents reported that they observed no impact for ISO implementation on expertise-utilisation, attributing it to not being a requirement by the standard. Others referred again to ISO as a formality and documentation system, which had nothing to do with expertise-utilisation.

Looking at the results by DG showed slight differences. However, when considering the difference between the 2008 and 2015 versions of the standard, a shift occurred for DG1. For the 2008 version, 6 thought it had positively impacted expertise-utilisation, while 10 did so for the 2015 version, in comparison to 7 for DG2. Besides, for the group suggesting no impact was observed, those who considered the standard to be irrelevant came from DG2, while those from DG1 attributed it to management style or to the fact it was already practised before introducing ISO. The informer disagreed with the results, explaining that ISO facilitated access to expertise and knowledge: *"ISO*

archived the existing expertise, both explicit and implicit, which created a guide to utilize existing cadre". The difference in opinions is thought to come from the different perspective. Employees consider their own under-utilization, while the informer talks about the macro level utilization of organizational capacity.

4.2.8. Changeability

In terms of change-readiness, 26 of the participants believed that their units were adaptable. Participants related adaptability to many factors, with one being top management's engagement and commitment, besides richness. Another perspective pointed to employees as the driver for change. At the same time, some respondents thought that changeability was dependant on top management's vision. The last group linked adaptability with incentives showing that employees need to be encouraged to adopt new work methods. On the other hand, 6 respondents believed their units did not exhibit adaptability, with the first and main reason thought to be external legal frameworks like government laws. Another reason was workload, as participants described. One last perspective indicated that change was impossible due to the rigidness of the organizational culture.

Breaking data by DG showed some difference as 15 out of 16 from DG1 thought their units were adaptable, in comparison to 11 out of 16 from DG2. This means that out of the 6 people pointing to the absence of adaptability, 5 came from DG2. The informer argued that adaptability in DG1 was perceived better than DG2 due to planning and engagement: *"change is led by top management. We prepared a 100-goal 5-year plan for the Directorate-General of Planning [DG1]... Change starts with goal formulation and employee engagement"*. However, having a 100-goal plan can explain the burden some employees complained about.

4.2.8.1 ISO Impact

Almost two-thirds of the responses [19/30] perceived ISO to have positively impacted adaptability. Respondents reported several observed effects they believed the standard introduced. First, participants indicated leadership's involvement as a key effect. Another effect came from a shift in focus caused by ISO implementation. The organization appeared to become more beneficiary-centric. The majority of this group indicated that continuous improvement, an ISO requirement, drove change and enhanced adaptability, therefore. Another positive impact was the follow-up loop ISO provided, which led to continuous feedback. This feedback was fed again into the improvement cycle. A participant added improved visibility presented by ISO as an impact that enhanced adaptability and set accountability. The latter meant people had to comply to the standard and improve their processes. Others believed ISO enhanced richness and self-organization, which meant rapid change when needed. The last impact was perceived to stem from risk management, as processes needed to be change-ready to overcome risk.

On the contrary, only 1 participant believed ISO had negatively impacted adaptability, arguing that ISO had fixed operation within a set rigid procedure. The other participants [10] considered ISO implementation to have had no impact on adaptability. Some looked at it as irrelevant, while others thought the impact was not as expected. Some attributed the absence of effect to the fact that change is in the end determined by management. One participant raised the lack of integration as a cause since the standard is only implemented in two DGs. The rest observed no impact because their units had been adaptable for years even before implementing the standard.

A close look at results showed no differences in general with 9 from DG1 and 10 from DG 2 indicating positive impacts, while only one from DG1 pointing a negative effect. Of those who believed there was no impact, 6 came from DG1 and 4 from DG2. However, the 6 from DG1 explained that the absence of impact was because adaptability had been always present in the DG even before introducing ISO. The informer provided an interesting remark showing that ISO contributed to more confidence which in turn contributed to improved adaptability, *"ISO has played a role by providing confidence that our performance meets a high standard… Recently, a ministerial decree was*

issued to restructure the Directorate-Generals of Planning [DG1] and Administrative Affairs [DG2] based on ISO results…".

4.3. Summary of results

The results[3] presented the following:

- Overall, communication flow was highly horizontal and smooth in the organisation. However, horizontality was considerably higher for DG1 than DG2. Regarding ISO impact, the standard seemed to play a key role in the established flow of communication with a high impact.
- In terms of employee engagement, the organisation seemed to have very engaged people. ISO implementation seemed to play a moderate role. This impact was higher for DG1.
- The organisation scored badly when it came to employee empowerment, which was low within the environment. ISO also seemed to have little impact on this aspect, although it moderately improved the situation in DG2.
- The investigation into the nature of work (routine-/process-orientation) showed a division between DG1 and DG2, with the first being very highly process-oriented and the second highly routine-oriented. ISO was found to have high impact, either by enhancing process-orientation in DG1 or by introducing continuous improvement to DG2, thus, presenting some aspects of horizontality.
- In relation to multidisciplinarity, the organisation was very highly multidisciplinary, with DG1 being notably more multidisciplinary than DG2 which was high. ISO was found to have little overall impact on the aspect in DG1, while no impact observed in DG2.
- The organization looked very highly cross-functional, especially for DG1. ISO had little impact here, though it did moderately enhance cross-functionality in DG1.
- In terms of expertise-utilisation, the organisation took great advantage of the expertise of its employees. The ISO 9001:2008 standard had little to moderate impact on expertise-utilisation, while the 9001:2015 version had a slightly better impact (moderate). The impact of the latest version was high in DG1.
- Finally, for change-readiness, the results showed that overall, the organization was highly adaptable, yet DG1 was considerably more change-ready compared with DG2. ISO seemed to have a high impact on this aspect, though the impact for DG1 was moderate.

To summarize, the results above suggested a number of key findings:

1) ISO implementation seemed to be more successful and fruitful under process-orientation and to some degree under semi-process orientation, while it looked inconsistent under routine-orientation.
2) Overall, ISO implementation managed to consistently drive the organizational structure toward higher levels of process-orientation for DG1, while it failed to move DG2 to the same level; however, it seemed to push a unit within DG2 toward semi-process-orientation.

Informer's reflection:

"I support these logical outcomes. I refer it to the nature of work, beside response to change... In the Directorate-General of Administrative Affairs [DG2], they are required to perform routine work, while here [DG1], our cadre support us to realize better results".

Figures 1 and 2 below (generated in Minitab 18) show how the two versions (2008 and 2015) of the standard had impacted process-orientation. The x axis shows ISO's impact, where 0 means no impact and 1 means perfect

[3] Extent of impact was based on proportion of responses for or against as follows: 0.2 = little impact; 0.4 = moderate impact; 0.6 = high impact; 0.8 = very high impact.

impact. The y axis refers to the level of process-orientation, where -1 (not shown since all figures were above 0) refers to perfect routine-orientation and 1 to perfect process-orientation. Bubble size also represents the level of process-orientation, where bigger bubbles represent higher levels of process-orientation. Note, two departments (Ds) were not plotted due to the very small number of participants[4].

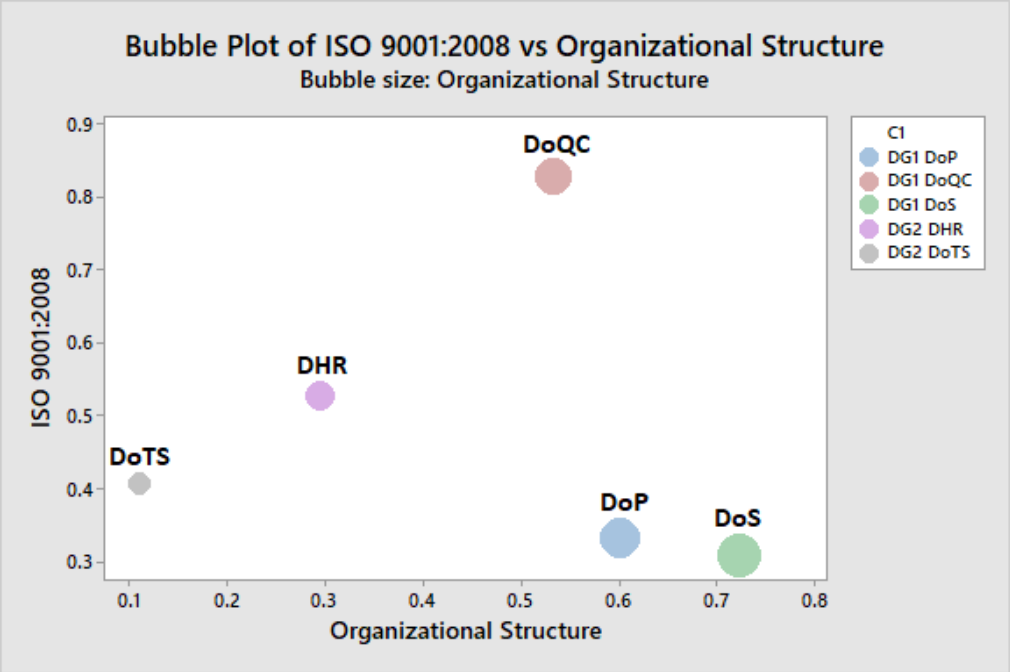

Figure 1. Process-orientation level and how ISO 9001:2008 contributed to it (at D-level).

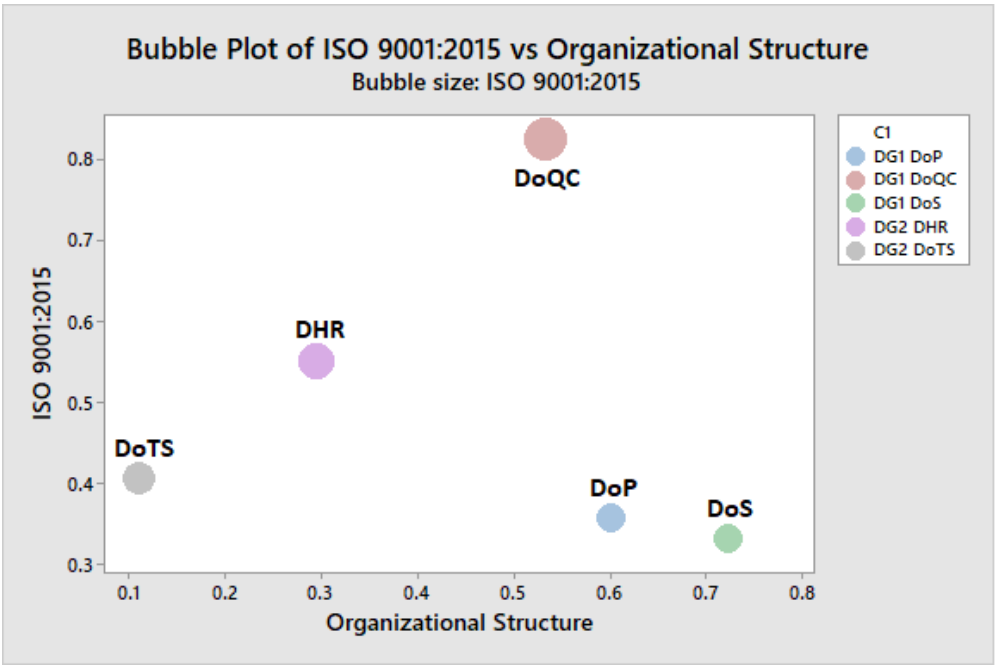

Figure 2. Process-orientation level and how ISO 9001:2015 contributed to it (at D-level).

[4] **DoQC** = Department of Quality control; **DoP** = Department of Planning; **DoS** = Department of Statistics; **DHR** = Department of Human Resources; **DoTS** = Department of Transport and Services.

5. Discussion and conclusion

The nature of the organizational structure, whether it was routine- or process-oriented, determined the extent to which ISO implementation was to be successful or not. The standard worked well under horizontal (process-orientated) and semi-horizontal structures, where it was perceived as a work enhancement method. On the contrary, under routine environments, the standard produced inconsistent results and was perceived as burdensome procedure. Besides, the organizational structure had a direct impact via its role as a moderator between ISO and resilience. The units exhibiting process-orientation appeared to be far more resilient when compared to routine-oriented units. In fact, the units with the most process-oriented organizational structure performed beyond the ISO level at some points, as their own requirements were more demanding. However, the interaction between the organizational structure and ISO was found to be very complex and perhaps worthy of further exploration, especially in terms of employees' attitudes and change management. It seems these two aspects play an important role but remain out of the scope of this paper.

In relation to the reviewed literature, the findings provide some support to previous research at the micro level of the concept. For example, the findings back Cyert and March's (1992) conclusion that routine-orientation creates commitment to rules and simplifies work, which was evident in DG2 where most work consisted of simple procedures. The findings also showed that under proceduralization people tend to be more change- and uncertainty-averse, which align with Nelson and Winter (1982) and Cyert and March (1992). This was noticed in DG2 where resistance to the changes ISO introduced prevailed, especially among older and long serving employees. Similarly, the findings provide support to Nelson and Winter (1982) and Champy and Hammer's (1993) suggestion that routine-orientation inhibits organizations' flexibility and responsiveness, which in turn limits resilience. Again, DG2 had less capability to overcome difficulty explained earlier. Yet less capability does not mean incapability, since techniques like self-organization were still noted, though, less frequently when compared to DG1.

The findings also back Hammer (1990) and De Feo (2017) who hint that process-orientation makes the organization more open to change. This was evident in the case of DG1 where ISO was more accepted and better practised. The findings showed that Process-orientation enhanced multidisciplinarity, and education and learning aligning with the propositions of Champy and Hammer (1993). Finally, the results agree with a stream of literature including Peter and Klaus (2007), Skrinjar et al. (2008) and Kohlbacher and Reijers (2013) that demonstrated improved performance due to process-orientation.

Beside supporting many of the previous assumptions about the role of the organizational structure in relation to change and flexibility, the findings of the research demonstrated the moderating role of the organizational structure between ISO and resilience. It showed how process-orientation is a prerequisite to achieve resilience through quality management practices. Also, the findings recognized a distinctive role of the organizational structure, which when mature enough directly enhances resilience apart from other management systems. Hence, the findings align with Dutt and Joseph (2018) and Ozanne et al. (2022) who demonstrated the instrumental role of the organizational structure in relation to uncertainty. They too found, inter alia, that process-orientation enhances resilience. Though process-orientation does support resilience, factors like, leadership, management and strategic direction, which lie outside the scope of this paper, still play key roles.

The paper contributes to the literature on strategic management and organizational structure by showing how organizational structures moderate the relationship between quality management principles, in this case ISO 9001 principles, and resilience. The paper provides empirical evidence on how both routine-based and process-based structures influence the impact of the standard on resilience. By demonstrating the vital role of process-orientation in enhancing resilience, the research exhibits how high reliability can result from and coexist with auditing. This should lead to better understanding of the interaction between the different studied variables within a given organizational structure. Hence, it contributes to the body of knowledge on strategy by establishing strategic

relationships between variables from quality management, resilience and organizational structure. Moreover, the study highlights the role of leadership in relation to the implementation of quality management initiatives, which in turn impacts resource management, risk management and resilience.

Regarding their implications, the findings urge paying due attention to the organizational structure both for the implementation of management systems and achieving resilience. This will enable better theorizing and conceptualization of resilient systems. The findings have practical implications to leadership too as they highlight the importance of both the work environment and organizational structure. Leadership should revise practices and encourage those instrumental for a resilient organization. This can even include the incentive system. Similarly, middle management needs to steer daily operations in accordance with practices that ensure both compliance and resilience.

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Conflict of interest

The author claims that the manuscript is completely original. The author also declares no conflict of interest.

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