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New Challenges for the Global Quality Management Systems in a Dynamic Environment - Development of Theoretical Framework

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Abstract: Globalization processes are relatively new phenomena, that have increasing trend in the industry, and mature insights into the complexity of management systems operating in a global environment are still developing. Therefore, this study used a systemic perspective to generate an initial body of knowledge about the challenges faced by global quality systems after the corporate expansion processes that can be drive from strategic partnerships and Mergers & Acquisitions (M&A) and be result in multinational companies. Data was collected from intensive field research concerning the development processes of 18 international companies for three years and analyzed using the Grounded Theory methodology. The analysis yielded the key variables that influence the work environment, constraints, interfaces, and goals of global quality management systems, as functional systems within complex, multinational, multi-interface companies operating in a competitive, dynamic, and changing market. The following five themes common to multiple variables were identified: The dynamic of global expansion, The development levels in global QMS as part of the expansion process on MNCs, the complexity of mutual relationship that aren't expressed in the conduct of the global QMS, the difficulty in regulating local and global needs of the QMS, and the lack of strategic concept for integrative management of the global QMS. Based on these five themes a model was proposed to study further the challenges faced by global quality systems. This paper is distinctive in that it adds dynamism as a dimension in the process of developing international quality systems and blends strategic, operational, and marketing rationale into thinking about quality systems. This research contributes to the construction of an initial body of knowledge that which presents, in a broad and integrative manner, the key issues concerning global quality systems, the process of their development, how they function and challenges they face.

Keywords: Globalization, Quality Management System, Global Quality Management, Mergers & Acquisitions, Integration Multinational Organization, Strategic Management, Strategic Partnerships

1. Introduction

The current paper presents the results of field research on quality management in global organizations, a managerial field on which previous research is sparse and may therefore be considered a "nascent theory." The study's primary objective was to fill knowledge gaps regarding the processes involved in developing global quality systems and how they interact with the complexities of functioning as a system within a large, complex multinational corporation (MNC), which operates in a market that is competitive, dynamic, and changing and has numerous interfaces and reciprocal processes. In order to achieve this, we carried out in-depth fieldwork in 18 MNCs to examine the issue of quality management.

Globalization processes change the operational environment's structure and create an array of processes and products that cross boundaries and national borders, posing a new set of challenges for quality managers at all levels [42]. The classic issues of local operations are still relevant, but global operations present new issues related to the global

distribution of production, procurement, marketing, management, and other functions. All of these factors have an impact on quality management.

The complex global environment of the twenty-first century and the necessity of changing how quality management is implemented and understood were delineated by Srinivasan and Kurey (2014) [56]. Their depiction stresses the mutual relationships that exist between production, product, services, and network processes.

According Mehra and Agrawal (2003), globalization offers many opportunities, but also creates far-from-simple challenges for management systems [41]. Thinking about production systems shifts from focusing on the individual plant and local process systems as a "closed system," towards an international network of plants. Internationally-distributed system do share many features with classic systems but also feature complex interactions that create an "open process system" that represents the inter-company set of processes that develops in global reality. Therefore, it is necessary to develop an overall perspective on coordinating interdependence rather than the traditional focus on separate production sites, because international production networks are integrated in non-aggregate, mutual relationships that require coordination.

According to Lamming et al. (2000), studies on production strategy are still restricted by the perceptual limits of classical concepts of production systems, and have not been adapted to the global reality [38]. *Global competitive strategy* can be defined as a firm's vision for the future, and the creation of strategic capabilities designed to meet existing and future needs of all stakeholders, especially local/global customers in a more effective manner than competitors, whether local or global [23]. Such a strategy assumes that products are relatively uniform in all markets, so that the firm's competitive strategy can encompass all of its interdependent strategic business units, wherever they are located, under the control of corporate headquarters [6]. The literature review conducted in the early stages of this study includes, *inter alia*, research and scenarios concerning the concept of quality management in the 21st century, and found that existing quality management concepts do not adequately cover the dynamics of change in the global market. Global quality management (GQM) has not been the subject of systematic research, and there is neither an orderly model and nor accepted methodology for GQM that adequately addresses the challenges faced by global organizations in today's world.

Although GQM is a natural result of global operations and production management, it still lacks an unequivocal definition and has not been researched systematically [36]. Perceptions of the role played by quality management in a competitive, global market remain murky. Senior executives do not necessarily understand the dynamics of a company's global expansion and its potential implications for the operational functioning of the quality system.

The sparsity of research on the subject and the absence of a methodology or model that relates to the issue and the multidimensionality of functional management at the global level, where it is subject to many business and strategic influences, highlight the need for in-depth field research into the positions of people active in the field. Participants in the research included corporate managers, especially quality and global operations managers in MNCs with ongoing managerial responsibility for global quality management and risk reduction, and those who deal with quality management in integrated and complex chains of processes, suppliers and customers.

This article is an initial stage in developing a body of knowledge and formulating theory concerning GQM. The lack of previous research supports considering this field a "nascent theory" that requires mapping key variables and developing up-to-date terminology integrating knowledge from additional disciplines in international management and global strategies.

2. Literature Review

Twenty-first century businesses operate in an increasingly complex global environment, where there are many mutual relationships between the production, product, services and network processes. These novel traits necessitate changing how quality management is perceived and implemented [56]. The focal point of management processes in MNCs moves from internal considerations to external ones [54]. Both production management and product engineering are inadequately prepared for the changes caused by globalization [52]. Consolidation processes advance gradually, and insights into the complexities that globalization has introduced to management systems are still immature. Quality management is no different.

A new definition of quality must be adopted to suit the deep imprint global changes have made on the concept of quality and its development. Formerly quality was defined by its ability to lower the percentage of defective products produced in a factory, but the new definition needs to be far more expansive. A literature survey on Global Quality Management (GQM) reveals that this widely used term lacks an agreed definition, and the overall field is not based on a stable philosophy focused on the importance of process management and intra-organizational coordination.

Organization globalization brings quality managers to face new challenges due to the changing working environment. The quality system aspires to meet the customer's needs, faces complex challenges when the customer is in different geographical locations and requires a response to regulatory requirements, cultural requirements, and unique local customs, which characterize the various local environments. According to Mehra and Agrawal (2003), although globalization provides growth opportunities, it also creates challenging management issues [41]. Such issues related to quality management receive added complexity due to the need to function in a high level of difficulty that demands intricate administrative and managerial strategies.

Several researchers have analyzed how quality management can best be implemented and the strategic advantage that it provides a company. Manufacturers that want to maintain their competitive advantages rely on their quality management system to avoid disruption, financial losses, and

irreparable damage to their firm's reputation [33]. Benson et al. (1991) examined how quality management can improve an organization's competitive edge [11]. Others contend that strategic planning and quality management are complementary and that good quality management is essential for maintaining a competitive edge [3, 13, 25].

Mergers and Acquisitions (M&A) are widely used by corporations striving to develop and grow [53]. Substantial research has been devoted to the behavioral, cross-cultural, financial, strategic and operational aspects M&A, with the largest number of studies examining finances and markets [5, 12, 14]. In the study of Bashan and Ben Jacob (2021) the researchers Reviewed the interactions between global company development via the process of mergers and acquisitions as a path to improve their market leading position [8]. The author found that companies must develop a strategy appropriate for their level of globalization and include effective integration mechanisms that combine the activities of its various functional systems, including the quality system, to create global value continually. When companies are able to utilize internal resources, they gain additional control over the project's schedule and deliverables. Alternately, inorganic growth methods, including M&A, offer immediate access to new clients, making them a path towards rapid acquisition of additional customers and projects necessary to increase revenue [8, 21].

Team leadership is among the many, varied factors that influence M&A performance, a key element for establishing an environment that facilitates the cooperative efforts of interdisciplinary groups, reinforces international relationships and guarantees a high level of trust [1]. According to Rottig et al. (2017) acquisition processes, national and/or organizational culture and corporate practices are essential factors in the success of M&A [50]. Others emphasize that communication plays a key role in enhancing M&A outcomes [24]. According to the study of Ben Jacob (2020) business leaders used to conduct successful M&A processes highlighted the following aspects: (a) leadership focus, (b) value creation, (c) integration strategy, (d) the review process, (e) relationship development, and (f) organizational governance [10]. The literature covers various models that can influence the outcome of M&A, including Steigenberger's (2017) recently proposal for a model built on four categories essential for M&A integration [57]. Nonetheless, very few if any models include the quality control system as a factor that influences the potential success or failure of post-M&A integration.

Bashan and Armon (2019) reviewed in their study the influence of M&A on QMS on the global company and its local companies [7]. In an international environment M&As, form a network of multi-reciprocal relationships, leading to questions about the best ways to manage multi-interface, cumulative structures and processes. Kim et al. (2003) studied the steps that multinational enterprises can take to ready themselves for effective global merging of business functions, and the impact that preparation has on M&A performance. [37].

In the global environment, competing multinationals are presented with additional, serious questions when integrating business functions in different countries ("functional global integration"), especially those concerning ways to merge corporate strategies for integrating varied business functions. "Functional global integration" has been defined as the coordination and control of individual cross-border business functions [40]. Malnight further contends that comprehending global integration through M&A is of the utmost importance, and stresses that globalization actually happens on the functional level, not on the organization level. Thus, reinforcing capabilities for implementing individual functions globally limits the potential for functional integration.

An understanding of the required changes in the company, and how they are to be implemented and managed are essential components of the guiding principles for all strategic management processes. It is also critical to develop a roadmap for sustaining those upgrades that lead to improved performance [43]. These processes must encompass the organization's quality systems.

Initial studies on planning processes for effective global mergers of specific business functions have evaluated both the functional and organizational levels. Other research examines the patterns followed during the merger of R&D and production functions [20, 28, 31, 45].

Establishing suitable mechanisms is essential to ensuring the functional merger of business operations, including QMS. Indeed, Kim et al. (2003) contend that there is no single, practical approach, and integrating global functions effectively is possible only if a tailor-made plan is followed for each function [37]. Therefore, recognizing the complexity of the MNC, and its functional needs on all levels, is critical to all considerations of QMS and their functional integration.

Effective quality management is a necessary element in a company's overall strategy. Garvin (1991) coined the term "Strategic Quality Planning," which he compared to an adhesive that holds a corporate quality system together [26]. Later, Tummala and Tang (1996: 13) defined it as "a comprehensive and strategic framework linking profitability, business objectives, and competitiveness to quality improvement efforts," and identify the fundamental core concepts to be considered when developing the strategy [60]. Srinidhi (1998) outlines ways to connect strategic planning stages to quality management and suggested a framework for quality management. He further defines Strategic Quality Management (SQM) as "the formulation and deployment of quality management within the overall framework of strategic planning, in a way that is aligned with all the other initiatives, such as process re-engineering, cost management, inventory control and target analysis" [55].

Deploying and allocating organizational, technological and human resources is a key element in SQM. The resource-based perspective on SQM outlined by Alidrisi and Mohamed (2012) focuses on the relationship between strategies and the relative contribution each type of resource makes to guarantee successful implementation [2]. Further, attention must be paid to the critical contribution made by supply chain management (SCM) and QMS to attaining a competitive advantage [33]. The global environment

intensifies issues arising from planning, allocating and deploying resources. Their work is not explicitly focused on global organizations but is relevant to MNCs with varying degrees of organizational complexity, and resources suited for their particular needs.

As MNCs expand, they spread not only geographically but also add vertical and lateral interactions, as they transition from the traditional model of a single enterprise to an international network with many inter-company processes. "Network organizations," according to Barabási and Frangos (2014) are formed when inter-organizational synergy with a multi-dimensional network structure is formed during a company's expansion process, replacing the classical tree structure [4]. Systems analysis is an approach based on the contingency theory [48] and on open and complex systems theories [49], which is well-suited for analyzing how multinational managerial and functional systems, including the development of MNCs. Indeed, the complexity of the competitive global environment and the impact of that development on the functioning of the global quality system can best be understood by adopting a systems perspective.

Bashan and Notea (2018) studied the global QMS status and suggested perspective model for managing the QMS in these companies [9]. Moreover, they examine how QMS function within an MNC, and construct a classification framework for system features, based on the structure for global operations and marketing emerging from expansion processes. Their study describes network structures with multiple interrelations, in extremely complex and challenging constellations that are created by M&A processes. Because the integrative management of multiple QMS within a group is often unclear and produces numerous conflicts, they highlight the critical nature of planning relevant integration mechanisms for all quality functions. The mechanisms' design must ensure mutual connections between each and every QMS in the company, because all must function as elements in a single organization, with minimal failures, while protecting quality throughout the MNC.

The need for a systems approach to global quality management and its potential for contending with the challenges faced by QMS was recently demonstrated by Bashan and Notea (2018) [9]. Also, Bashan and Ben Jacob (2021) presented a preliminary attempt to develop theories and methods for analyzing global QMS in the dynamic field of mergers, acquisitions, and strategic partnerships [8]. Previously, Kafetzopoulos et al. (2015) showed that QMS is a fundamental prerequisite for any firm's successful penetration into new markets, and may enhance its competitive power and ensure a higher quality product [35].

3. Methodology

The present field study presents a coherent approach to managing global quality management systems (QMS) in a demanding international arena.

The dearth of previous research on GQM is itself a challenge for confirming the quality of field research, because methodological compatibility is built on internal consistency between the research questions, research design, and theoretical contributions [22]. Scrutiny of previous efforts is a critical component of the process for choosing a research method. The framework offered by Edmondson and McManus (2007) distinguishes between three archetypes – mature theory, intermediate theory, and nascent theory – that can be followed when designing methodologically-compatible research. Considering their archetypes, the literature review and the pilot study led us to conclude that research on GQM should be classified as a nascent theory, the archetype best suited to a new phenomenon about which there is little, if any, prior theory, research, or formal theorizing. In this situation, qualitative methods are used for gathering data [22]; in the current study, these were observation, interview, observations, and collecting documents and materials from field sites.

Conversely, the extraordinary complexity of global, competitive markets would suggest that a qualitative research methodology, and systemic perspective would be beneficial. The interrelationships between the various actors in global markets can hardly be represented or quantified by standard, static tools of mathematical analysis, which are not designed to depict dynamic interrelations, such as those formed by global M&A [27]. The multidimensionality of GQM can be better understood using systemic analysis, which is supported by the theories of open systems, complex systems, and networks. These methods have all been used beneficially for probing the activity of MNCs.

The current research unitized the Grounded Theory Methodology developed by Glaser and Strauss (2017) [30], because it is well-suited to the non-linear, multi-dimensional environment of global management. Grounded theory is a framework for identifying key variables and developing a nascent theory. It offers investigators a technique for generating theories by revealing emergent patterns in data, via a complex iterative process. The first step begins with raising generative questions to guide the study. Core concepts are identified once initial data is gathered and then connections between the theoretical core concepts and the data drawn. Subsequent steps are content analysis, verification, and summation.

The specific tools use in the current study were observations, content analysis, and in-depth interviews with knowledge leaders (CEOs, quality managers, and global mangers) in 18 multinational companies, chosen according to the following criteria:

Compliance with accepted definitions of a MNC, as described in the literature.

Good representation of both parent companies and subsidiaries. The 18 multinational companies included 11 parent companies and 7 subsidiaries operating within the corporation. To overcome the numerical imbalance caused by research constraints, the number of interviewees in parent companies and subsidiaries was adjusted, as noted below in the section on the in-depth interviews).

Care was taken to ensure the inclusion of multinational companies operating in a varied industries – e.g.,

computerized communication systems, pharmaceuticals, semiconductors, power plants, electro-optical technologies, telecom, security, food, medical, information mining, software-based analytical solutions, sophisticated security – and many types of global activity, such as production, development, and outsourcing.

Triangulation was used to validate the study. Findings were presented only if they were indicated by at least three sources. This process also enhances the possibility of drawing generalizations from the specific sample to the general population [19, 39, 51]. For the triangulation process, we used:

In-depth interviews conducted, over three years, with VPs of Quality and VPs of Global Operations from 10 MNCs (parent companies + subsidiaries). Researchers interviewed 39 people, some of them more than once, for total of 60 interviews. The average length of the interviews was approximately 100 minutes. To ensure adequate representation of parent companies and subsidiaries, 28 interviews were conducted in subsidiaries and 32 interviews in parent companies. The repeat interviews with the same people at different times was intended to capture the changing dynamics occurring in the global environment and its impact on global quality function. All interviewees dealt, either directly or indirectly, with quality management on the strategic level and/or on the daily tactical level. The interviews focused on the following topics:

Key fields and processes included in responsibility of the Global Quality Manager;

Differentiating between local and global levels of activity in the company's quality management;

Changes in the quality system's roles and needs as the firm transitioned from being a local company to being a global one;

Key challenges faced by global quality management;

The impact of dynamics based on M&A and strategic partnerships on managing the global quality system; and

Promising proposals and ideas for developing a new approach that addresses the needs of global functional management within the quality system of MNCs.

Multiple Case Study is the optimal method for investigating current phenomena, because it requires the researcher to consider reality from multiple angles, thereby providing many opportunities for cross-referencing data [61]. The present study is based multiple case studies conducted in all of the 18 participating MNCs, including analysis of scenarios related to their global expansion processes, the challenges these scenarios presented to the quality system, and the conduct observed in each.

A Focus Group. Six global quality VPs presidents, each employed by a different MNC, was formed. The group has special expertise in global quality management, and was convened in order to probe crucial issues from varied perspectives. The focus group met three times, for 3.5 hours each time, and gave researchers access to data they were unable to obtain from the depth interviews, a framework for cross-checking data, sharing knowledge and discussing issues with experts in the field, as they honed their research conclusions.

Data sources included documents such as, but not limited to, minutes of meetings regarding an improvement to operating systems and global quality systems of participating firms.

Once comprehensive, detailed data was collected about each firm's international activity a "global profile" was prepared for each firm. Of the many aspects covered, the current articles are concentrates on two: objective data concerning the companies and their M&A history; and the challenges faced by the QMS of an MNC, as raised in the interviews. As recommended by Corbin et al. (2014), Grounded theory methods were used to processes the data and differentiate between the needs of QMS on the local and global levels, define regulatory activities for attaining global quality value and identify gaps [18].

Grounded Theory is primarily an interpretive tool [47], which the current study uses as foundation on which the findings were developed, bringing together the perspectives of the participants and researcher alike [34, 58]. Analysis of the qualitative data relied on two strategies: descriptive analysis and interpretation methods [17] and constant comparative analysis [29], which is based on the Grounded theory methodology for coding and category development. As noted above, Grounded theory is an iterative process that moves from data collection, to identification, information coding, and finally collapses the codes into categories [15, 16, 29, 62]. Application of constant comparative analysis generated data from the current purposive sample. Data collection and analysis was concurrent with initial coding and category identification, and later followed by the storyline and theoretical coding.

Descriptive analysis and interpretation is a continuous, cyclical interaction between data, interpretations, and descriptions in a dialectical, repetitive process that continues until the general meaning structures reach saturation [59]. The principle underlying the descriptive analysis and interpretation method stresses that interpretations ought to emerge from the data, so that the connection between the conclusions and the research observations and context is explicit and unambiguous [44, 59]. This research approach processes the mutual responses of the researcher and the subject being observed to form proposed findings even before they are finalized and changes are still being made. The theoretical profiles of the local and global quality systems were developed using this strategy, as compelled by functional response mechanisms.

The advanced mapping phase combines groups in primary categories, and draws links between them, in order to hone in on the inter-category relationships and capture the full potential inherent in the data. Figure 1 visualizes the stages of the Grounded theory methodology as used in this study. It displays the principle stages in the data analysis process and their potential periodicity. Data analysis processes can be iterative or cyclical when additional, cumulative findings show that the previously determined distinctions need to be refined. This feedback processes between the emerging information and new data improve analysis.
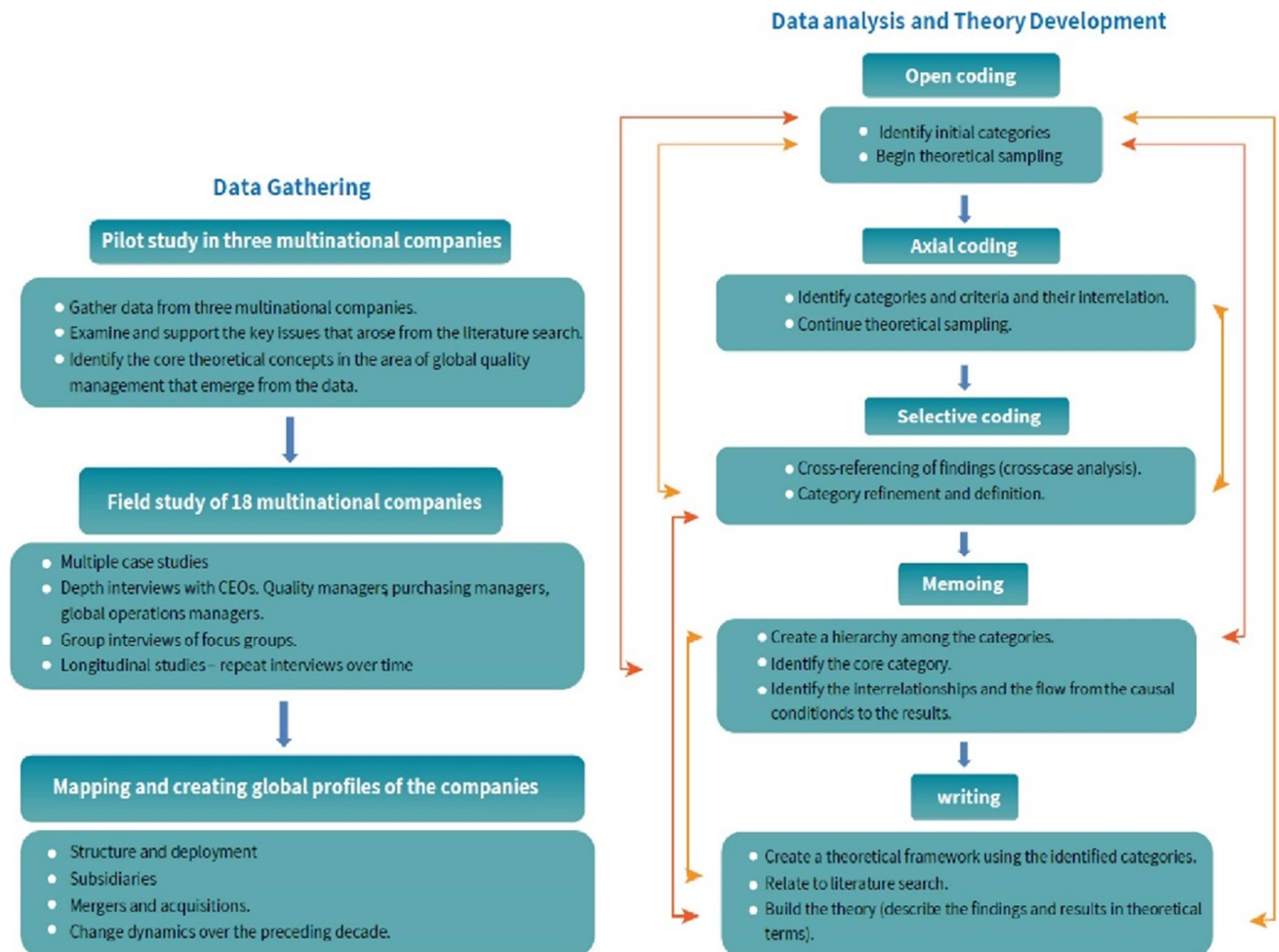
Figure 1. Grounded theory methodology.

4. Results

During the categorization and mapping processes, local and global management systems traits were found to be crucial attributes of MNCs. Global and local needs are simultaneously reflected in the behavior patterns of GQM and other management systems. Bashan and Notea (2018) found that many levels of the global, strategic partnerships, and business models are created when M&A impact the structure of an MNC and drive it into a networked process structure having various operational interfaces that necessitate expanding process concepts. Most often, these patterns are established by the corporate HQ. [9].

Survival in the competitive global environment landscape forces MNCs to make dramatic changes and increase the complexity of their global and local systems. Likewise, international strategy is now a key research topic. MNCs frequently seek strategies that could be useful for exploring and exploiting capabilities essential for accruing advantages in global and local markets [32].

Data analysis process: Mapping the main categories and integrating knowledge from strategic and operational disciplines

This section provides a visual overview of the main research findings, based on the data analysis and formulation of principle research categories, as discussed above in the section on materials and methods. The findings from the analytical process and the connections to the relevant professional literature represent the key issues in global quality management, create thematic relationships, examine the interactions and organize the knowledge using an axial coding model an construct the core categories we identified [58] (Strauss & Corbin, 1994). These topics, which will be discussed at length in the discussion section, identify and shed light on the main problems and challenges faced by the quality system in the global reality, as a basis for further research processes on the nascent theory.

Finding and defining primary categories

Strauss refers to this stage as "open coding," and the themes identified at this stage are called "primary categories." In subsequent stages, data is collected in order to confirm or refute these initial categories, refine them and clarify their formulation. Sometimes, additional categories are added or initial categories are eliminated. The categories evolve as the analysis progresses.

This stage presents the broadest possible data that might shed light on the key issues and challenges impacting how

QMS function in global reality, bridging the knowledge gaps on the subject. The diagrams presented on the following pages were produced by mapping the research findings, illustrating the systematic formation of key themes, and presenting the key challenges facing QMS in a competitive, global environment, based on their operational and marketing characteristics.

The figures below depict interpretations that integrate the researcher's perspective with other interpretations based on the interviews with global quality managers' and the present literature review. The descriptive analysis and interpretations method [44, 59] and constant comparative analysis [29] used in this process were outlined in detail above, in the Materials and Methods section.

The visualizations make it possible to incorporate several dimensions in a single image, and present the interactions between them, as reflected in the functioning of the global quality system.

Figures 2, 3, 4, and 5, below, present the main findings. The visual presentation clarifies insights that are difficult to express clearly and conveniently using either spreadsheets or voluminous texts.

Step 1: Mapping primary categories that emerged from findings of the field study, and mapped in the Open Coding phase.
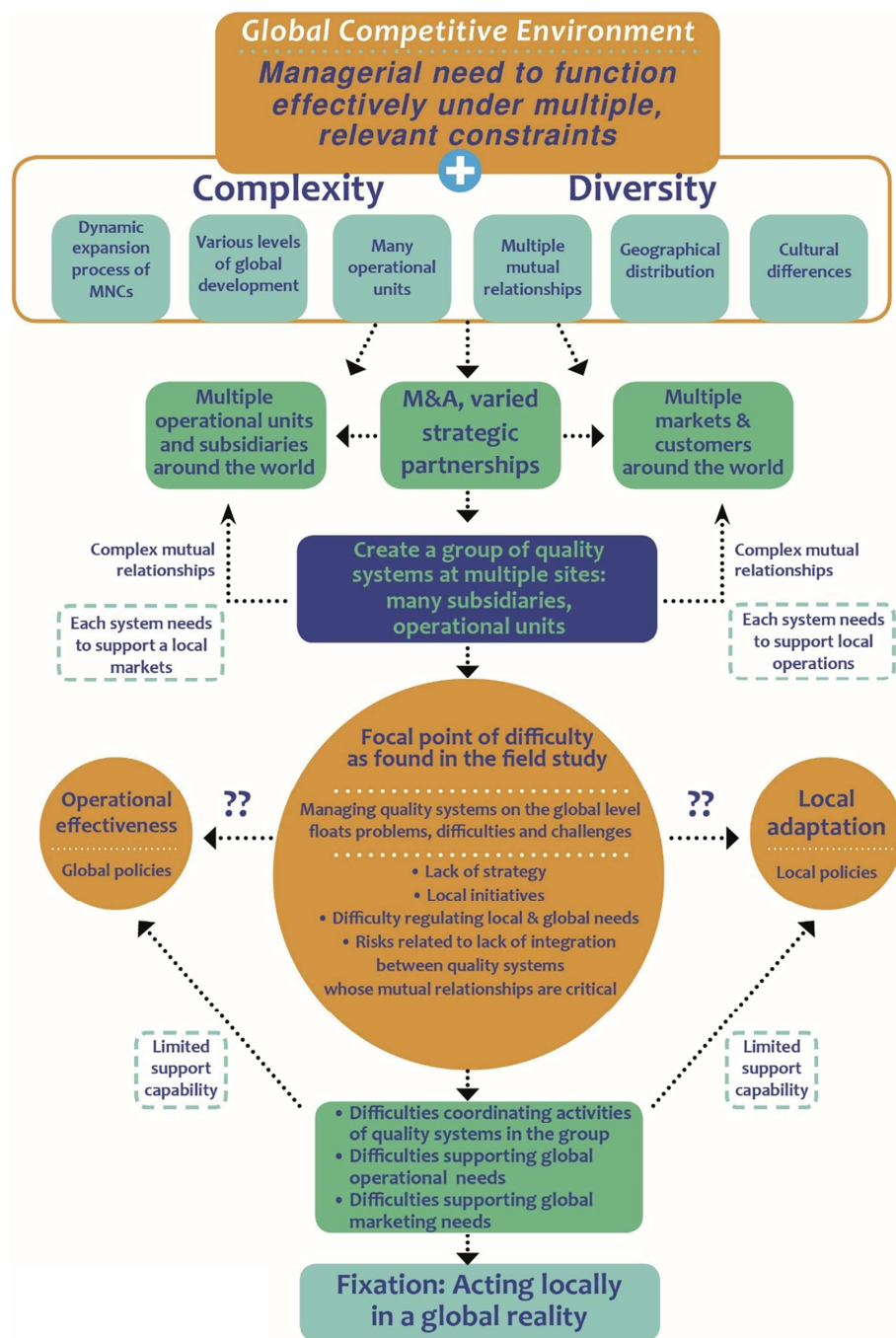

***Figure 2.** Diagram of primary categories.*

Step 2: Expanding the mapping process

The mapping process is expanded by linking primary key categories (Figure 2) to the research literature and international and strategic management theories. In this stage the categorical theory is developed. The analysis also draws on theoretical, strategic, operational marketing aspects of parallel disciplines concerning the development of multinational companies:

1) Global strategies for international management.
2) Global development level of operating and marketing systems.
3) M&A processes, strategic partnerships and international business models.

Mapping of the categorical theory formulation offers a possible interpretation of the initial categories identified in the open coding presented in Figure 3.
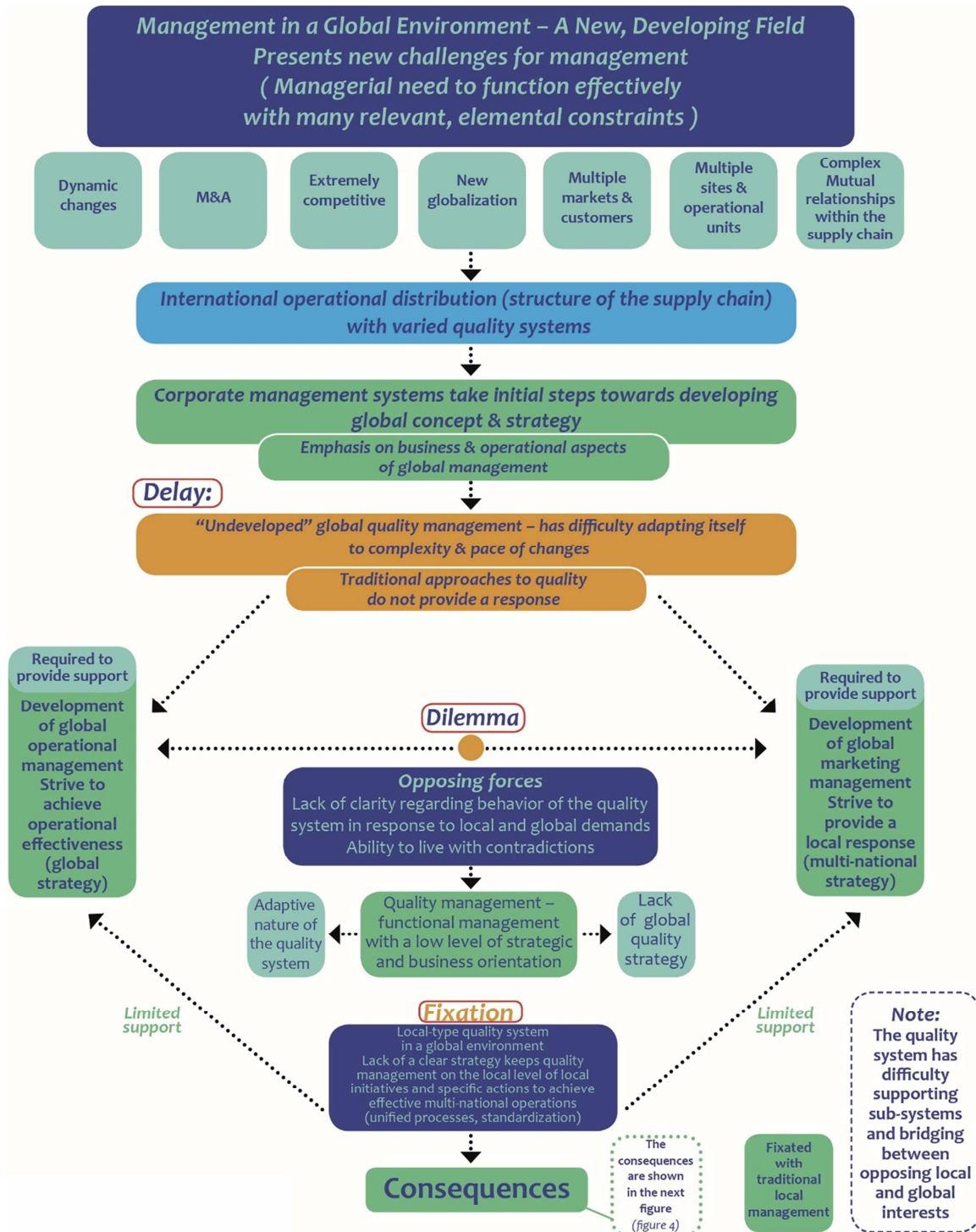

Figure 3. *Developing categorical theory.*

Figures 2 and 3 depict a systemic perspective for analyzing the activities and stages of development of the global quality function, as part of the expansion process of an MNC. The figures show the extraordinary level of complexity in the dynamic global environment, particularly the vast number of autonomous participants who interact with each other and change dynamically. The global quality management system is required to support all of them on both the local and global levels.

Management of the global quality system (on which our research focuses), here represented by a group of multi-site quality systems (an aggregate system), is exposed to difficulties and challenges arising from the need to address both local and global needs. The latter are often dictated by corporate quality management at headquarters, whose orientation is primarily concerned with operational efficiency and cost savings.

The lack of a clear global quality strategy gives rise to many dilemmas that are reflected in Figures 2 and 3, and leads to fixation: behaving locally in a global reality, which impairs the organization's competitiveness and limits its ability to respond to global environmental conditions.

Step 3: Managerial implications of lacking a global quality strategy

Figure 4 continues Figures 2 and 3 by depicting the managerial implications of not having a global quality strategy, as they emerged from the analysis of our findings. It branches off from the bottom of Figure 3.
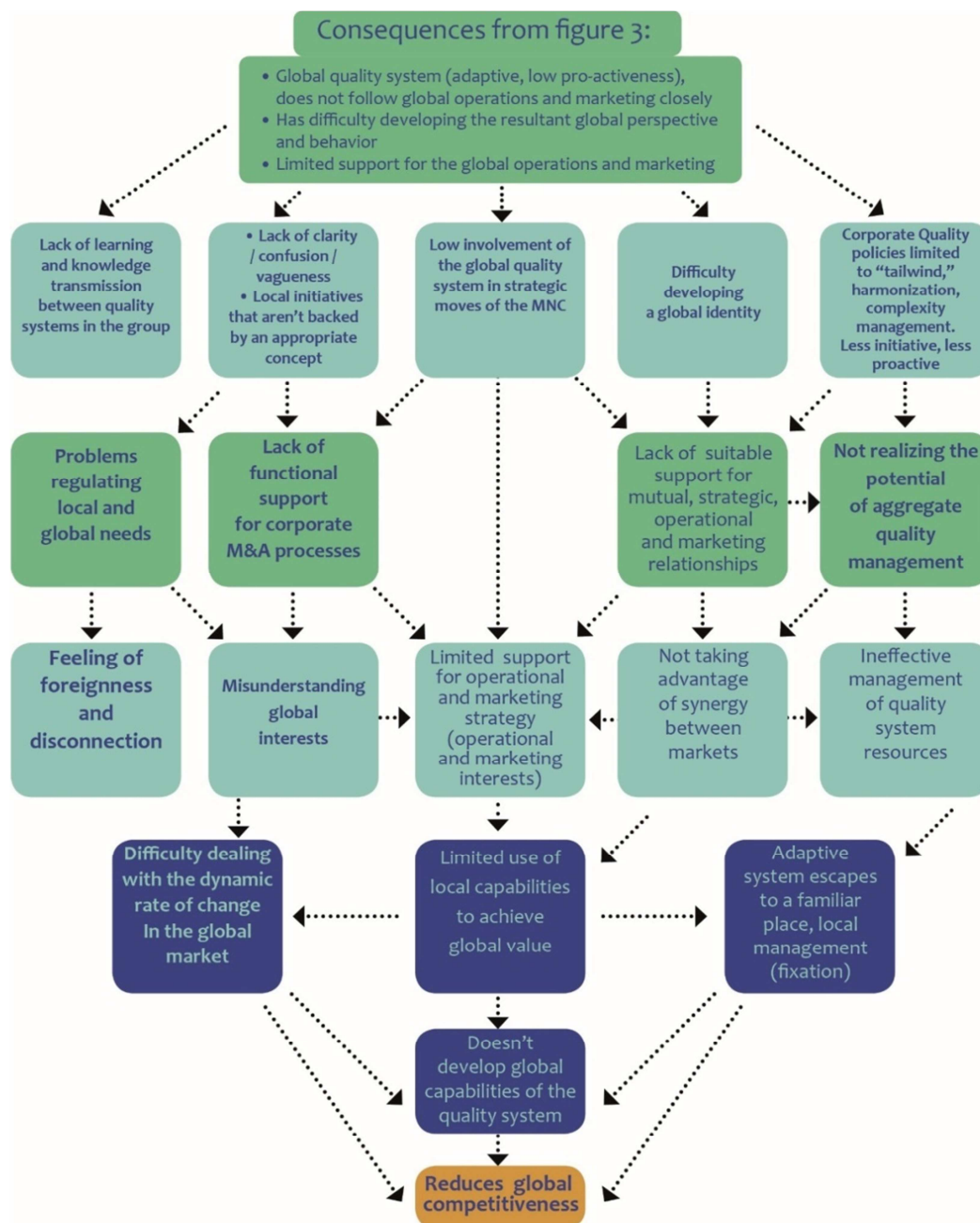

Figure 4. Principal managerial implications of lacking a global quality strategy.

Main themes in GQM

The analytical steps and mapping of key variables, as presented in Figures 2, 3, and 4 converge into a theoretical structure locating the coding categories on an axis of causal conditions, central theme, context, influencing conditions, strategies and results. The model is presented with arrows aimed from top to bottom and from left to right, showing the flow between the causal conditions (root factors) to the results that reflect the five main themes and the core categories in which these themes coalesce. The arrows further show that the internal contexts and conditions that directly influence the choice of the proposed strategy.
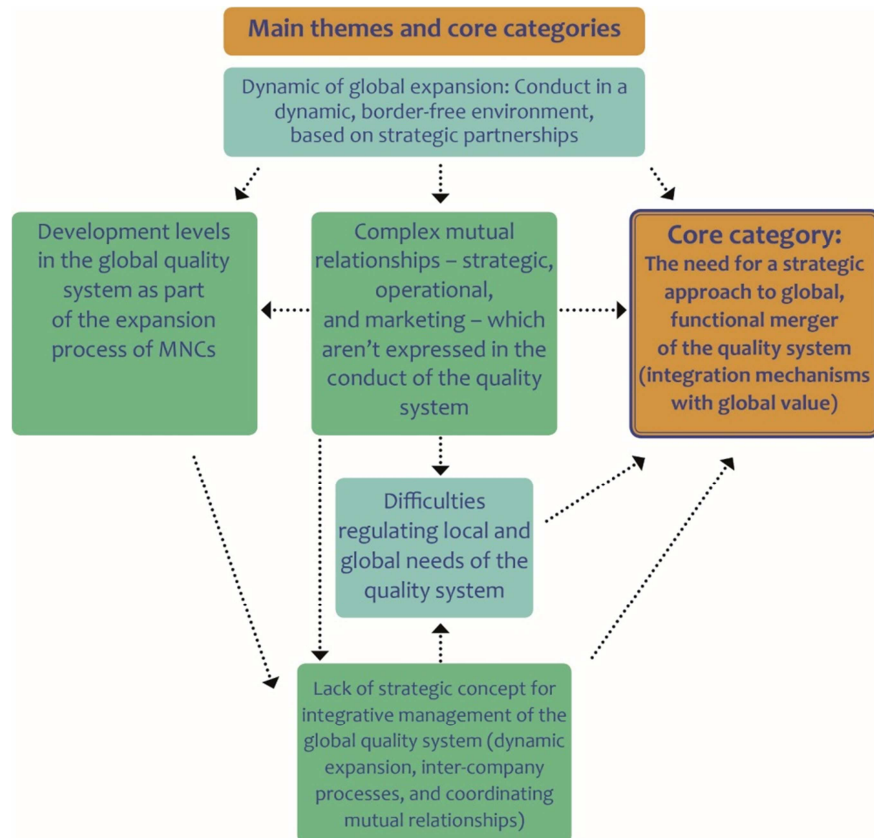

Figure 5. Main themes and core categories.

The central themes and connecting links shown in the diagram present the initial body of knowledge on quality management produced by long, complex research process, and linking the current findings to scholarly literature in diverse international management disciplines. These themes represent the challenges faced by global quality systems that emerged from analysis of our findings. We will briefly survey them below because they point to relevant key issues in the field of GQM that require attention and in-depth research, in order to establish the body of knowledge and theoretical infrastructure.

5. Discussion

Figure 5 depicts the five main themes formulated during the data analysis process and the core categories in which they coalesce. These themes and the interrelationships between them (thematic connections) represent the key variables for the continuation of research processes and the construction of the body of knowledge in the field of global quality management, and are at the center of this discussion:

5.1. The Dynamics of Global Expansion: Behavior in a Boundary-Free, Dynamic Environment, Based on Strategic Collaborations

Encoding and analyzing findings from our field study of 18 MNCs shows that the dynamics of a company's expansion through mergers, acquisitions and strategic partnerships is a key factor that poses challenges, difficulties and dilemmas for the functioning of GQM. Dynamic growth and expansion in a global reality, changes target markets, client composition, geographical distribution and mix of products and processes of an MNC. Therefore, their quality systems must cope with a rapidly changing international arena. Performance is affected by the operational and marketing changes caused by the possibilities for expansion available to the MNC, not only M&A but also a variety of strategic partnerships with business rationale.

The developmental dynamics of a MNC creates changes in the number, composition and interdependence of its operational systems, resulting in the aggregate QMS systems that must be integrated into a single system for the entire MNC.

Therefore, the necessary, basic assumption is that the QMS must develop flexibility and be able to respond to changes on the functional management level, when functioning in the face of the constant change dynamics of the competitive, global environment.

5.2. Developmental Levels of GQM During the Expansion of an MNC

Global expansion of a local system into diverse locations creates an international system with a variety of products and a range of processes conducted at multiple sites with diverse dependent relationships. The classic model of a single organization operating at a single local site (or even several sites), with work processes occurring in a defined local environment and a quality system that supports a local operating system, is almost irrelevant to global reality.

Companies with only specific global characteristics, such as global customers and/or suppliers, and therefore on the lowest level of a global quality systems, might indeed fit a classic process perception but they are not representative examples of MNCs operating in the field and the challenges they face. Bashan and Notea (2018) address several levels of globalization and complexity of operational systems, and compare them to the needs of the quality system necessary to support them [9]. This dimension requires expansion, because different levels of globalization present the quality system with different challenges and needs resulting from evolving structural configurations (such as network organizations, spin-offs, and leading subsidiaries).

The field research findings show that quality systems face different challenges and needs as a function of the level of global complexity characterized by the mapping process. The complexity of the process structure, strategic, operational and marketing interfaces, and the dynamic changes that the system faces exposed varied problems, with different intensities, that require pertinent consideration.

Consequently, establishing the globalization level of the quality system and its characteristic operational configurations become key issues linking global expansion measures to the operating system's structure and the QMS required to support them. The networked nature of international operating systems, which is a product of the geographical distribution process as wells as horizontal and vertical interactions, become critical trait that requires analysis, and must be addressed at the level of global quality management.

5.3. Complex Strategic, Operational and Marketing Relatedness That Are Not Expressed Through the Behavior of the Quality System

Being satisfied with presenting an MNC as a company composed of numerous local companies, each of which is run to achieve its local goals, is limited and dangerous. It does not reflect the strategic role of each subsidiary, operating unit and quality system in the global space. The findings of the field research are indicative of the difficulty inherent in the aggregate management of varied quality systems in a group, including integration of the quality systems that are acquired or join the group through the processes of the M&A and strategic partnerships that characterize global expansion.

It can be difficult for the parent company to coordinate its aggregate activities in the innovative structures that characterize high levels of global development, such as network organizations, strategic partnerships, etc. These structures encompass complex interactions based on diverse combinations of business processes, collaborations and connections to suppliers. At the functional level, the global quality system finds it difficult to support the dynamic grid of strategic, operational and marketing interactions and other coordination or integration mechanisms as necessary to create global value. The obstacles to integrating multiple, differing quality systems was mentioned repeatedly throughout the field research. It is primarily the result of the limited interfaces between the company's strategic and business activities, and its quality system, as well as the lack of sufficient insights into aspects of international business management that are not at the core of the quality systems' traditional activities. We found that identifying the interrelationships between quality systems and the operational and marketing systems, which change form and composition (as a result of various strategic steps taken by the MNC), is a key issue affecting the desired functioning of a global quality system, one which must be reflected in future theoretical development processes.

5.4. Difficulties in the Regulating Local and Global Needs of the QMS

Analysis of the findings clearly shows that both local and global factors are present in global spaces, and must be considered in the functional management in the aggregate deployment of the QMS. The findings further show that regulating the local and global needs of the quality system is a demanding challenge. The dilemma of how to address these conflicting needs, which is itself due to the lack of a clear concept, was prominent.

The quality system is required to address local needs and work with local suppliers, customers and internal processes (autonomous management of each local quality system). At the same time, it needs to interact and coordinate with the other quality systems in the group, and with the parent company's quality system, to support the dynamic development of global operations and marketing (interaction-based behavior and integration) with emphasis on achieving operational effectiveness and using the company's shared pool of resources. Dealing simultaneously with local and global needs provides a practical example of how systems cope with conflicting needs of dependence and autonomy, known in the literature as "Loosely Coupled Systems." Orton and Weick (1990) describe the effort to integrate these opposing forces, as part of the problem posed by the complexity of an MNC [46]. The corporate quality staff has a critical global-integrative role in coordinating and

incorporating functions, which becomes increasing necessary as the complexity and global development of the company increases.

The findings reflect vague concepts, significant ambiguity and conduct that vacillates between complete autonomy (dealing with mainly local needs) and limited initiatives that aim to achieve some degree of integration, primarily by seeking ways to achieve operational effectiveness (economic rationale) and address global needs.

The system functions on both local and global levels, according to the needs that arise on each, although the levels are usually not clearly defined or identified within GQM's areas of activity and responsibility. During the field research we found that corporate executives face many difficulties when attempt to regulate the needs of the quality system in all of the above areas, because of the bidirectional pressures for implementation. Local and global needs are often in conflict with each other, and tension intensifies when because they are not backed by proper conceptual identification and management.

Regulating the global and local needs of the quality system is also identified as a key issue (theme). It and is an outgrowth of the two previous themes (as shown in the figures above). It is necessary to deepen its functional response to simultaneous pressures from the local and global markets, while differentiating between local and global needs, in order to regulate them more effectively on a network basis.

5.5. Lack of Strategic Concept for Integrative Management of QMS

A clear quality strategy, appropriate to the changing global competitive environment, is essential but currently conspicuous only in its absence. It is needed to ensure the global advantages, while also maintaining local responses tailored to the needs of unique customers and markets. Integrating and coordinating the operation of the group's various quality systems making them into an aggregate quality system is also required, and the responsibilities for the networked processes within the company must be defined.

Despite the widespread use of the term "Global Quality Management," there is still no broadly agreed definition or concept, therefore the question of how can companies effectively address diverse customer requirements in markets around the world, from the perspective of quality management, has not yet received an adequate response. The current findings show that quality management is only slightly involved in the global expansion of MNCs, and inadequate global orientation was also identified on managerial levels.

The absence of a global quality strategy, like other functional strategies, despite the intensive globalization, applies brakes to realizing the company's global strategy; therefore, its development must be pursued. An adaptive quality system that focuses on operational effectiveness and short-term visions cannot support achieving a competitive advantage. The quality system's ability to provide global value lies in its ability to develop strategy with a long-term orientation that is derived from and proactively supports the

company's global strategy. The strategy must be based on understanding the stages of global development, and supporting strategic, operational and marketing interactions while simultaneously managing local and global needs.

5.6. Dynamic Processes Such as M&A Led to the Necessity to Develop the Global Functional Integration Plan

Globalization brings to increase in the level of differentiation of the multinational company. Adding to this complexity is the natural need of a company to expand its footprint organically or inorganically via the acquisition of companies. In using mergers and acquisitions (M&As), business leaders can develop new markets quickly or seek the transfer of technology and innovation to keep pace with the globalization of business. Still, this critical process fails to deliver the expected value to the acquirers. Several factors can influence the M&A outcomes, such as communication, culture, relationship creation, and an effective integration process [10]. The integration challenge is reflected in how the functional systems, including the quality system, interact. The reason for that is the global company structure that is divided into different systems, subsidiaries, and operational units. Those units operate in other locations and still need to develop organizational structures, management patterns, strategies, and products that will suit the local environment. There is a need to establish robust integration mechanisms to ensure the connection between the various branches, the coordination and cooperation between them, and the collaboration in resources. Also, it will ensure the utilization of capabilities and maintaining uniform standards necessary to maintain the company's reputation around the world and the development of a multicultural program that will support the goals and values of the company.

The integration process includes global cross-functional functions such as Supply Chain (SC), Human Resource (HR), Research and Development (R&D), Finance, and more. HR integration process was investigated showed that there is still no clear outline on how HR integration should be conducted or what content it should cover [15]. The researcher concluded that HR integration mechanisms are essential to be full partners at each step in integrating businesses in an M&A as the carrier of knowledge transfer and synergy creation and the moderator for process harmonization and change management. Researchers discussed the role of supply chain integration to enhance the strategy that fits the product to support its competitiveness and the need for companies to strive to create an extended organization, including partnering with their suppliers [53]. Supply chain integration management should comprise information and material sharing between organizational units to meet customer satisfaction. Other research studied supply chain integration and presented the benefits of improved supply chain performance to reduce ordering costs, cycle times, inventory levels, and business uncertainty [65]. The researcher discussed the internal and vertical integration within a firm and between departments, plants, and divisions of a firm as a tool to improve performance and provide it

with a comparative advantage. Also, the expansion of its integration, externally and horizontally, to both suppliers and customers would enable a focal firm to continuously learn from its partners and reap enhanced efficiency and efficacy benefits derived from its supply chain partners. The impact between post-merger integration and human resource management was also studied and researchers suggested strategies to link them to improve M&A outcomes [14].

5.7. The Need for a Strategic Approach to Functional Global Integration of QMS (Core Category)

All of the main themes, and the interrelationships between them, coalesce into one core category, which reflects the need for a strategic approach to the functional global integration of quality management systems, in other words developing integration mechanisms with global value. Again, this development requires a clear strategy that is conspicuous in its absence. The current findings indicate a lack of clarity regarding the level of integration, coordination, control and monitoring between the various quality systems in the group (aggregate quality system), and the local and global value they are capable of achieving.

Each quality system operates as a functional unit within a defined environment and is required for supporting the local operating and marketing system (local products and processes). At the same time, the heightened level of differentiation within the MNC, due to the dynamic nature of its environment, requires developing appropriate integration mechanisms for ensuring that the various parts of the corporate system remain connected and function as a single organizational entity.

The findings show the lack of a clear strategy regarding mechanisms for integrating quality systems, which is most significantly evident in M&A processes where how the quality systems of the acquired company should be integrated into the MNC's quality system is vague. The lack of well-defined integrative mechanisms leads to a broad spectrum of behavior, which is basically trial and error, on the way to institutionalizing connections with value.

The functional merger of global quality systems requires creating integrative mechanisms for ensuring that the various QMS (within the aggregate system) remain interconnected and function as a single organizational entity. This should reduce failures and ensure quality throughout the global market, while providing both local and global added value. In actual practice, this means finding new ways to integrate between the sprawling, active networks of companies operating in different geographical areas but under the overall responsibility of a single MNC. Functional global integration must acknowledge that all business functions require their own particular integration mechanism in order for there to be effective global merger between units. Existing research shows that the issue of functional merger in the global quality management system is the key issue for determining how to create value by realizing mutual strategic, operational and marketing relatedness in a network. Functional global integration of GQM requires having

insight into international strategy, operations and marketing that provide the rationale for the merger and the level of integration required between the system. It is important to emphasize that the issue of functional global integration is part of a broader issue faced by MNCs competing in a global environment, and considering, in general, how best to merge business functions that cross national borders.

6. Conclusion and Directions for Future Research

6.1. Conclusion

Evaluating the functioning of the QMS as a functional system in local and global environments, and the dynamic conditions characterized by M&A, strategic partnerships and integrated supply chains requires systematic thinking and the use of appropriate tools for systematic analysis. The key themes identified while analyzing findings from the field research, and presented above, are foundation stones for developing a body of knowledge regarding global quality management. Expanding and deepening the research on these issues would provide a further foundation for developing a global quality management model that presents the central problems and challenges faced by QMS in the complex reality depicted in the findings from the field study.

Therefore, we consider it of great importance to continue the research process in developing a strategic approach to the functional global integration of quality systems to lay foundations for developing additional processes and models. Integrating other disciplines related to international and strategic management into future research is essential in order to achieve an interdisciplinary, systemic perspective that supports the ability of the quality system to provide global value.

The contribution of a global quality strategy made possible by developing a body of knowledge to increase an organization's competitive ability is depicted conceptually in Figure 6.

6.2. Theoretical Contribution

The main contribution of this article is its construction of an initial body of knowledge that which presents, in a broad and integrative manner, the key issues concerning global quality systems, the process of their development, how they function and challenges they face. As one of several global functional systems, the QMS of an MNC must deal with challenges arising from a complex, competitive environment with multiple interfaces and mutual relationships, and be able to operate in a dynamic and changing market.

Conceptualizing key variables for GQM, previously conspicuous in their absence, required incorporating knowledge from additional disciplines in international and strategic management, and using systemic analysis approaches to examine strategic, operational and marketing interactions that the needs and behavior of GQM.

The main themes underlying the initial body of knowledge developed here consider quality management an integral part of the company's international management, and incorporated in its steps towards global expansion. This concept is innovative and not typical of traditional quality management concepts. Its treatment of dynamic processes that change the boundaries of an MNC is far from the core of classical approaches and perceptions.

Examining the challenges, dilemmas and responsiveness required from the quality system in a reality shaped by M&A, strategic partnerships and global processes supports the need for involvement at the international management level and in strategic steps taken by the company. This creates a foundation for developing a global management strategy.

This paper provides an appropriate theoretical foundation for future research: mapping additional variables, developing metrics for evaluating performance levels of quality systems in various global configurations, developing integration mechanisms for the aggregate management of the global quality system and examining interactions with other global functional systems.
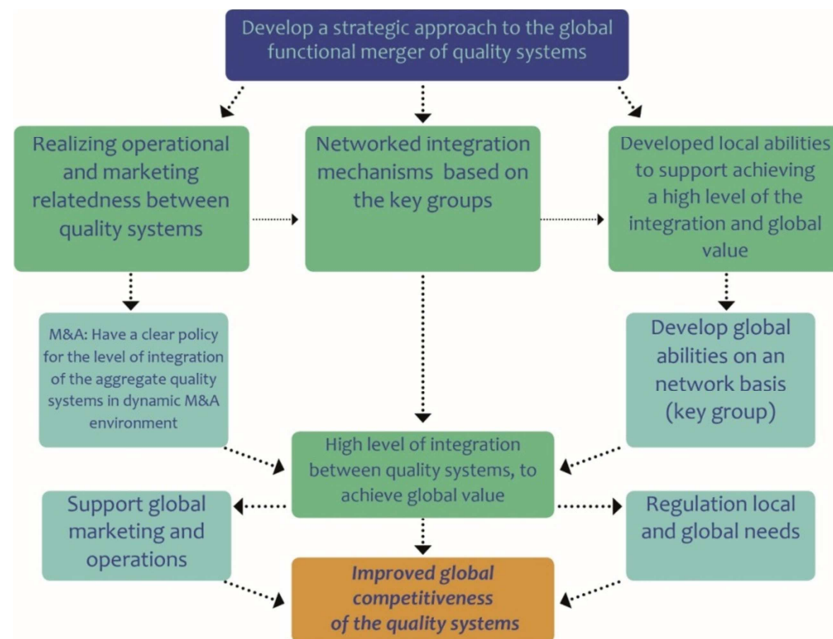

Figure 6. *The contribution of a global quality strategy to improving corporate competitiveness.*

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