

Reflecting Upon Management Systems: Content Analysis and Synthesis

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Abstract

The purpose of this paper is to present and discuss/reflect on some well-known quality, strategy and excellence frameworks or models in order to understand the development of the management systems from the classical theory to now. In addition we try to understand the problems or limitation which such kind of models still may have, and in that sense, we proposed a possible macro elements and characteristics of an integral Management System. The studies examine some leading quality, strategy, excellence frameworks or models and discuss/identify their strengths as well as weakness. The chosen models and frameworks are Taylor's principles (1911), Fayol's operations (1914), System theory-frameworks (1969), Peter's and Waterman's eight excellence attributes (1982), the EFQM European Excellence model (1992), list of best practices (1998), the ISO 9000 norms (2000), Toyota's 4P model, and Kaplan and Norton's Management System (2008). Generally, quality, strategy and excellence models and frameworks are inspired by the classical management theory and/or Japanese practices and they recognize the importance to manage any organization using a Management System, which can be integrated by a hard and soft dimensions. Any dimension it is integrated by some elements and some characteristics. Therefore, as a result we attempt to make a first possible description of an integral Management System. On the other hand, our findings indicate that there are tendencies to interpret these models from positivistic view and ignore the soft dimension of the Management System (human aspect), when organization try to implement the model in their struggle to achieve quality and/or excellence, and when they try to translate the strategy in an effective process operation. An integral and holistic Management System can reduce these negative tendencies. The paper aspires to be of interest as much to researchers as to professionals in the manufacturing and service industry, whether they have middle management responsibilities, or are general managers, and also to all

those employees whose work is related to some positions of authority (managing people and resources), with the object of understanding the Management System as an integral and holistic view that any organization uses to develop its strategy and translate into operational action and monitor and improve the effectiveness of both.

Keywords: Management System, Models and Frameworks, Best Practice.

1. INTRODUCTION

The current economic and financial crisis and the prospect of world-wide pandemics are posing greater challenges to company survival and making life much harder for firms' managers. In our view, these challenges stem from four sources. First, there is the difficulty of managing companies to make them increasingly effective and efficient. The quest for "management excellence" is becoming harder and more complex because of external pressures (more demanding customers, more competitive markets, the need for both quality and fast response, economic and financial turbulence, potential pandemics, etc.). Second, when executives look at the vast body of knowledge on management, they are faced with a welter of complex theories that are often difficult to put into practice. Third, there is a big gap between academic knowledge and practical prescriptions in the management field. Fourth, from the practitioner's standpoint, it is hard to find more effective strategies and implementation for achieving management excellence. Here, it seems the traditional mechanistic model of management [1] seems ill-suited to coping with rapid, turbulent global change. This may explain why so few companies have risen to the challenge of attaining organisational excellence. Perhaps another reason lies in the dearth of work on what management means in the 21st century (in management system terms).

The academic and practical importance of this research lies in management science's need to find new challenges and visions for the 21st century. As Gary Hamel [2] observes, "modern management" dates from the end of the 19th century and has run out of scope for improvement. For this author and the group of scholars and CEOs from around the world who meet to discuss the subject, it is vital to chart new courses for management and to innovate in the field. Accordingly, this paper closely links at least five of the challenges identified by this group of researchers as facing 21st century management: *Challenge 3* - rebuilding the philosophical foundations of management; *Challenge 11* - radically reducing the influence of the past; *Challenge 9* - reinventing strategy creation as an emerging process; *Challenge 21* - free imagination; *Challenge 23* - bring management up to date so it can cope with an open world. Many managers today wish to scrap mechanistic approaches and are seeking alternative systems and technical approaches. They are doing so because they need to find better ways of coping with global pressures, cutting costs and boosting cash revenues - [3]. When company managers try to find these approaches, they are faced with a sea of information or, as Koontz puts it [4]: "*with a wave of great differences and apparent confusion*". In other words, there are so many management fashions and trends that the systems and models that once worked (or that still work) are losing their originality [5].

The general purpose of this article is to give background on the quest for a "*Management System*". A subsidiary aim is to present, analyse, debate and reflect on some of the best-known models and conceptual schemes covering quality, strategies and excellence with a view to charting the development of *Management Systems* from classic theory to the present. The models and conceptual schemes selected were: The Principles of Scientific Management; Taylor (1911); Fayol classic theory (1914); systems theory and models (1951); Peter and Waterman's eight attributes of management excellence (1982); the EFQM (European Foundation of Quality Management) model (1999); the ISO 9000 norm (2000); the list of best practices (2004); the Toyota Motor Corporation's Business Model; the management system presented by Kaplan and

Norton (2008). In addition, we sought to understand both the strengths and limitations of these models for companies trying to cope with global pressures.

A further subsidiary aim of this research is to present the first conceptual descriptions from a “*Management System*” perspective. Accordingly, this paper sets out an initial definition of the elements and features of such a system, this being based on our theoretical analysis of the aforementioned concepts, models and theories. This task is far from simple and the authors are fully aware of the limitations to their approach (for example, it covers a small number of management models). It follows the line taken by work on other subjects [6] [7] and comes up with an initial theoretical framework for tracking down management systems in the scholarly and management literature.

At the end of this paper there is a section on contributions and discussion, followed by a section giving our final conclusions and managerial implications.

2. PRELIMINARIES

2.1 The Classic Management School (Taylor and Fayol)

This section describes the main features of Scientific Management as defined by Frederick Taylor (1911), and the theories of Henry Fayol (1914). In terms of the development of schools of management thought, the oldest classical theory is *Scientific Management or Industrial Engineering*, posited by Frederick Winslow Taylor [8]. Both Taylor’s and Fayol’s approaches to management are what Koontz [4] calls “the management process school” or what Lemack [5] referred to as “the classical paradigm”. However, this author indicates that the work of Taylor and Fayol was not necessarily the first example of this paradigm, given that work by Daniel McCallum in 1850 grappled with how to design a 500-mile railway for optimum efficiency. Likewise, work by Josiah Wedgwood attempted to establish a cost-accounting system. There were also Charles Babbage’s efforts to build the first analogue computer, and work by Charles Dupin in France [5].

Returning to our argument, Taylor revolutionised traditional work systems through the application of “scientific methods” in companies to improve productivity. These methods proved highly successful in dealing with the technical problems found in the workplaces of the time [8]. The four basic management tasks were published in *The American Magazine* in three issues [9]:

First, They develop a science for each element of a man’s work, which replaces the old rule of thumb method.

Second, They scientifically select and train the workman, where in the past he chose his own work and trained himself as best he could.

Third, They heartily co-operate with the men, so as to insure all of the work being done in accordance with the principles of science which has been developed.

Fourth, There is an almost equal division of the work and the responsibility between the management and the workmen. The management take over all the work for which they are better fitted than the workmen, while in the past almost all the work and the greater part of the responsibility were thrown upon the men.

Taylor (1911) proposed a functional, formal structure as the basis of scientific management, the need to set targets and then split the work up into small units (simple tasks), an action he termed “specialisation” or “functional management”. Adopting this approach, Taylor noted that supervision should be split between various overseers specialised in particular aspects of the work. He also sought to ensure that each of these work tasks was co-ordinated within a Management System, with the result that workers would eventually become experts and find the best way to do their jobs within the system as a whole [10]. Taylor was a pioneer in creating management systems and in splitting work up into simple tasks that were then co-ordinated within an organisational whole. Some authors go so far as to argue that Taylor’s approach revolutionised the way work was seen and opened a new path [11].

However, this division of work and the concomitant company hierarchy did not really take root until Henry Ford set up his automobile factory. Here, the work was directed by specialists or engineers who knew the work inside out. The workers were simply required to follow their orders. In other words, the engineers/specialists designed sophisticated manufacturing systems and the line staff simply followed their plans [12]. Taylor considered that workers need to be trained in accordance with the principles of Scientific Management so that they could overcome their own mental and physical shortcomings [13]. In Taylor's words:

Now one of the very first requirement for a man who is fit to handle pig iron as a regular occupation is that he shall be so stupid and so phlegmatic that he more nearly resembles in his mental make-up the ox than any other type. The man who is mentally alert and intelligent is for this reason entirely unsuited to what would, for him, be the grinding monotony of work [9].

As one can see, this kind of approach to Scientific Management focuses most on "hard" management aspects (i.e. those bearing on the planning and execution of work). The lack of "soft" elements in the management system created an imbalance in company management practice. In other words, workers were simply seen as cogs in the machine. The end result was lack of commitment, high staff turnover, lack of motivation and loyalty, and failure to work in teams [14]. As far as Taylor was concerned, work inefficiency could be explained away by "soldiering" (slacking): *"Soldiering" as it is called in this country, "hanging it out" in England, "ca canny" in Scotland, is thus almost universal in industrial establishments [...] the writer asserts without fear of contradiction that this constitutes the greatest misfortune, one might almost say the greatest evil, with which the working people of both England and America are now afflicted* [15]. Taylor's idea of unleashing the power of Scientific Management through the rationalisation of work processes established the basis for concepts such as cost-cutting and boosting productivity through process re-engineering. However, scant interest was shown in motivating workers.

Finally, despite all its negative consequences, Scientific Management theory focused on the "hard" part of the management system (technology, work, organisation) and was then a giant leap forward in organisational and management theory [16], requiring, as Taylor noted:

[...] the equally complete mental revolution on the part of those on the management's side – the foreman, the superintendent, the owner of the business, the board of directors – a complete mental revolution on their part as to their duties toward their fellow workers in the management, toward their workmen, and toward all of their daily problems. And without this complete mental revolution on both sides, Scientific Management does not exist [17].

The second theory analysed in this section was formulated by a French industrial engineer, Henri Fayol in his book "Administration Industrielle et generale", which was published in 1916. He came up with a fairly comprehensive theory that provided 14 management principles [18]. At the beginning of the 20th century, most management authors had been schooled in engineering and science and Fayol was no exception to this rule. His thinking on management therefore followed this kind of line. Fayol argued that all of company's activities/operations could be split into six groups [19]:

- 1.- Technical operations: tasks bearing on turning out goods (products and services).
- 2.- Sales operations: tasks linked to purchasing and sales transactions.
- 3.- Financial operations: tasks linked to fundraising and the effective use capital).
- 4.- Security: functions whose aim was to protect people and assets.
- 5.- Accounting: financial control tasks, bookkeeping, inventories, balance sheets, cost control, statistics.
- 6.- Administrative operations: forecasts, organisation, direction, co-ordination and control of all aspects of the firm's activities.

Fayol's work established the basis for management of the company as a whole within the framework of a Management System. The six activities set out above constituted the interrelated work processes carried out by any firm. In the sixth activity, which he termed administrative

operations, he established the planning, organisation, management and co-functions that still hold good today. For Fayol [19], each of these administrative activities was of prime importance for orderly management. As he put it: “These six groups of operations or essential functions exist in all companies, no matter how simple or complex, large or small they may be.” Finally, both Taylor and Fayol’s work, which lay the foundations for what we now know as the Management System, was strongly influenced by contributions from Max Weber [20] and his theory of bureaucracy. Although Weber’s work also embraced the political and social spheres, its six principles of bureaucracy: division of work, management hierarchy, formal selection of staff, formal rules and norms, neutrality, and professional orientation constitute the key features of what are known as mechanistic organisations [1]. Such organisations thus apply the scientific and bureaucratic principles identified by Taylor, Fayol and Weber [21].

2.2 System Theory and Models

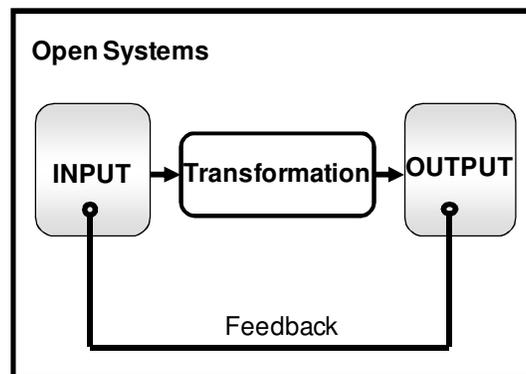
For time out of mind, man has tried link his knowledge to form a corpus that could explain all the interrelationships. Thus Plato and Aristotle’s cosmovision attempted to see reality from a holistic standpoint (from the Greek *holos*, meaning “the whole”) [18]. Although this provides a plausible system-based theory – that is, a set of elements with a common purpose and that behave in a common fashion because they are interrelated [22]– the idea did not take off until the 1990s with the publication of *The Fifth Discipline* by Peter Senge [23]. However the application of the term “systems” to the management field can be traced back to Barnard’s work [24]. For Barnard [25], an organisation is seen as “a system of consciously co-ordinated activities or forces of two or more persons”. Notwithstanding the importance of Barnard and Simon’s contribution, Harmon and Mayer [26] trace system theory back to Wiener and Forrester’s work in cybernetics, general system theory of Ludvig Bertalanffy and Talcott Parsons’ work in functional structural sociology. Systems theory may thus be seen as a synthesis between the classic approach and one based on behaviour and human relations [18].

In reviewing the literature on management approaches, we were struck by the work of the mathematician Norbert Wiener after The Second World War in the field of anti-aircraft teams, automatic pilot systems and radar. His work led Wiener to come up with the idea of self-regulation – the use of continuous feedback to guide a mechanical or organic system to adapt to environmental changes. Wiener applied this idea to organisations and management in his book *Cybernetics* [27] in which he set forth a very simple model of inputs that are processed into outputs by a feedback cycle to make corrections [28]. The work of Jay Forrester, a computer pioneer at MIT, focused on what he termed “system dynamics” and stated that managers tended to act on “problem symptoms”, not on the underlying problems. He also argued that such symptoms are created by the system as a result of feedback [23]. Another strand in systems theory was woven by the biologist Ludwig Von Bertalanffy, who in 1951 argued the need for interdisciplinary work to formulate a scientific language and methodology: “These considerations lead to the postulate of a new scientific discipline which we call general system theory. Its subject matter is formulation of principles that are valid for “systems” in general, whatever the nature of the component elements and the relations or “forces” between them... [29]”. Accordingly, Bertalanffy coined the term “general system theory” and left it to other scientific disciplines to interpret its supposed all-embracing scope, balance and the system’s interaction with its external environment [30].

Lastly, *The Social Psychology of Organizations* by Katz and Kahn [31], and Thompson’s *Organizations in Action* [32] rounded off systems theory and its models, which found their modern expression of a scientific paradigm in Thomas Kuhn’s work [33]. The main aim of Katz and Kahn’s book [31] was to provide a “skeleton” or a meta-theory for a broader model in which organisations were seen as open systems. Katz and Kahn postulated that repetitive activities by a group of individuals acting under time and space constraints possess basic system features – inputs, “black box” transformation and outputs. Figure 1 shows this scheme, which is described as the Open System Model (of which biological and social systems are good examples). It shows an analogy with a “black box” system in which interaction with the environment allows the system to receive inputs and turn them into outputs [24]. These authors argue that an organisation may become a large system transforming inputs into outputs to create a continuous flow of operations.

This vision is diametrically opposed to Taylor's Scientific Management, which sought to understand the component parts of organisations and fit them together to make the whole. The unit of analysis in the system model is the organisation's system or its sub-systems covering work functions and activities. According to Kast and Kahn [31], the sub-systems embrace: production; supply; institutional relations; staff functions; change processes; work management and control. To sum up, systems theory and models conceive organisations and their management in the following terms:

- 1.- An organisation's parts can only be understood in relation to all the other parts.
- 2.- The parts of an organisation, including its relationships, are important to the extent that they contribute to the functioning of the whole.
- 3.- Organisation, conceived as groupings, may be considered as analogous to biological organisms (open systems) that are faced by challenges and needs affecting the whole community.
- 4.- A system-based approach allows one to analyse an organisation's dynamics (i.e. organisational evolution and deliberate change) rather than just the status quo.
- 5.- An organisation has strong links with its setting, which furnishes the conditions needed for organisational management.



Fuente: Interpretado de Freemont Kast y James E. Rosenzweig. Dic. 1972. *Academy of Management Journal*, 15(0004), Pág. 450.

FIGURE 1: The Open System Model.

2.3 Attributes of Peter and Waterman's Management Excellence model

Hermel and Ramis-Pujol [34] state that "Excellence" is a hard concept to pin down. The literature contains various definitions of the term, different approaches to management excellence and the criteria for success [6]. Although Hermel and Ramis-Pujol [34] came up with an evolutionary classification of management excellence, these authors and others agreed that practical application of the concept to firms dates from Peters and Waterman's book *In Search of Excellence-Lessons from America's Best Run Companies* (1982). In the twenty seven years since then, the concept has cropped up throughout management literature and practices. Peters and Waterman [35] set out the following eight attributes of excellent, innovative companies:

- 1.- A bias for action, meaning that although companies' approach to decision making may be analytical, they emphasize the importance of experiments. It is believed that too many detailed analyses may be barriers against problem solving. Thus, their approaches to solving problems and challenges are often experimental and dealt with immediately or in a relatively short time through the establishment of cross functional teams where external partners such as customers or suppliers may also participate.
- 2.- Close to customer, meaning that the successful companies really listen to the voice of the customer and also use the voices as input for continuous improvement and new product and service development.
- 3.- Autonomy and entrepreneurship, meaning that all employees – not only people in R&D - are expected to be creative and innovative in their daily jobs.

- 4.- Productivity through people, meaning that people are expected to come up with ideas for waste reductions and productivity growth by providing the proper framework, i.e. respect, involvement and empowerment.
- 5.- Hands-on, value driven, meaning that the company's philosophy vision and values are seen as the main guideline and are far more important for daily activities and challenges than technological or economic resources.
- 6.-Stick to knitting, meaning that the excellent companies stay close to the business they know.
- 7.-Simple form, lean staff, meaning that the underlying structural forms and systems in the excellent companies are elegantly simple and top-level staffs are lean.
- 8.- Simultaneous loss-tight properties, meaning that the excellent companies are both centralised and decentralised. On the one hand, for example, they have pushed autonomy down to the shop floor or product development teams, and on other hand, they focus tightly on the few core values they hold dear.

However the fact is that some of the companies on which Peters and Waterman [35] based their study turned in poor results in the last decade of the 20th century and the first decade of the 21st century [6]. This indicates that the attributes that paid handsome dividends in the 1980s are not necessarily a recipe for success today. Furthermore, companies' need to operate through management systems may indicate the first step on the path to excellence [36] is fraught with hazards. Peters and Waterman's note [35] that the "soft" aspects of a company (i.e. values, motivation, leadership, staff participation) are the foundations for any management system.

2.4 The EFQM Model (European Foundation of Quality Management)

Set up in 1988 to foster Total Quality Management and excellence in European companies, the EFQM model has spread within European firms as a tool for evaluation and for achieving strategic change. The model provides a framework covering five facilitating agents: Leadership (10%); Staff (9%); Alliances and Resources (9%); Policy and Strategy (8%); Processes (14%). It also sets out four criteria regarding end results: customer results 20%; staff results 9%; social results 6%; key results in the company 15%. In other words, the five agents are the cause and the four results are the effects. The result criteria also provide information and feedback, guiding the agents' actions through learning and innovation (EFQM, 1999). Each of these criteria rest on the following eight planks: (1) results orientation; (2) customer focus; (3) leadership and constancy of purpose; (4) management by processes and facts; (5) people development and involvement; (6) continuous learning; (7) innovation and improvement; and (8) partnership development and public responsibility [37].

In practice, the model is applied through the self-evaluation carried out by each company in assessing its management performance using nine yardsticks to measure "strengths" and "areas for improvement". Both elements help identity the gap between present performance and ideal performance, and to plan improvement measures [38]. Some of the advantages of the EFQM model described in the literature are that it fosters: process standardisation and improvement; identification of opportunities for improvement and organisational learning; an integrated approach to improvement through a single management system that integrates strategies, processes and result (capitalising on previous experience); process measurement and redesign in the light of results; customer satisfaction; staff involvement in the form of improvement teams and other measures; value creation for all stakeholders [39].

Other authors have noted some of the drawbacks in implementing the EFQM model. These include: (a) the non-prescriptive nature of the model and failure to set out how it should be applied in specific cases [40]; (b) the sheer breadth of the model, which sometimes makes it difficult to know where to begin, how to make its results visible, and how to sustain improvements; (c) the danger of using the self-evaluation just to win the coveted EFQM Prize and forgetting the real purpose is to improve; (d) the difficulty of getting people involved, particularly in local government [41]; (e) despite the nine implementation criteria, some authors have reported that corporate culture and the company's maturity largely determine whether EFQM implementation is a success or failure [6].

Finally, both the eight key concepts and the nine application criteria may constitute sub-systems of the organisation's overall management system. Indeed, the EFQM model [38] describes itself as a management system that can be defined as: "a general scheme of processes and procedures for ensuring that the organisation carries out all the activities required to meet its objectives". Starting from this definition, some authors have indicated that the dominant management paradigm in the EFQM model is rational and measurement-oriented – in other words, it focuses on the "hard" part of the management system. Although the EFQM model includes "soft" or human aspects, when it comes to implementation it is precisely these elements that are the most intangible, difficult to apply and optimise [42] [43].

2.5 ISO 9000 (Version 2000): A Quality Management System

This quality management system is based on the International Organisation for Standardisation (ISO), a body set up in 1946 and based in Geneva. It fosters international norms in the fields of manufacturing, trade and communication [44]. The forerunner of the ISO 9000 family of quality management norms was British Standards - BS 5750, and was further extended in 1994 [45]. In 2000, the norms were thoroughly overhauled. The result was the ISO 9000 norm Version 2000. The main norm in the ISO family is *ISO 9001:2000 – Quality Management Systems – Requisites*. This was complemented with *ISO 9000:2000 – Quality Management Systems – Principles and Vocabulary* (ISO 9000, 2000). The norm comprises eight sections: (1) Purpose and scope; (2) Norms; (3) Terms and definitions; (4) Quality Management System; (5) Management responsibility; (6) Resource management; (7) Product or service production; (8) Measurement, analysis and improvement [46].

The 2000 Version of the ISO norm focuses on an organisation's ability to satisfy its clients and on process management and improvement. This is a change from the 1994 version of the norm, which focused exclusively on ensuring product/service quality [47]. In addition, the new norm includes Deming's PDCA improvement cycle (Plan, Do, Check, Act) in order to link ISO's guiding principles as part of continuous improvement of the whole management system [48]. In practice, the ISO 9000 norm is based on a set of documents (Quality Manuals, Procedural Manuals, Registers, etc.), which are evaluated through internal audits that compare the norms with the institution's daily management. Once documented and evaluated by the organisation, the quality management system is then submitted for certification through an external audit conducted by an outside body. Periodic re-evaluation is carried out in connection with existing certification [49].

The literature reports various benefits from implementing ISO norms, including: organisation; work standardisation and documentation (processes and procedures); establishment of a quality control system; reduction in faults and hence lower operating cost and budgetary requirements [50]. Other authors report that application of the ISO 9000 norm facilitates process standardisation and measurement and fosters greater customer satisfaction [49]. Furthermore, the norm also seems to encourage greater orderliness in the way staff work, cutting down the time needed to train new staff [51]. Reported problems in applying the norm include: (a) excessive documentation of procedures, norms, etc.; (b) improvement and innovation run into the sand and end up not being implemented; (c) paradoxically, the quality of the organisation's services and products may not be advanced, with defects cropping up after the certificate has been awarded; (d) lack of strong motivation, given that collaboration may be based on the goals/interests of certain groups; (e) departmental-based certification, forgetting the need for a cross-cutting approach to processes [52].

Finally, it is important to note that for ISO norm purposes [46], a management system is understood as: "*a system to establish policy and objectives and to achieve those objectives*". This is a fairly vague definition, indicating that the ISO 9000 norm focuses more on the efforts made by an organisation to achieve a quality management system than on the detail. According to ISO norm [46] the quality management system is defined as: "*management system to direct and control an organization with regard to quality*". We are thus left in the dark about the relationship between management system and quality management system (if this kind of dual relationship

exist in the organization?). Lastly, we considered that the management sub-systems could be interpreted as ISO norm criteria.

2.6 Good practices as management sub-systems

As a result of Peters and Waterman's work [35], several authors have tried to draw up a list of good management practices for putting an organisation on the path to excellence [53]. Two studies stand out in this respect, The first was by Mansar and Limam-Reijers [53] who carried out an on-line survey between 2003 and 2004. They obtained a wide range of best practices covering process re-design. The questionnaire was administered to practitioners who had a great deal of experience in the field. The results revealed the following ten best practices: (1) task elimination; (2) task composition; (3) integral technology; (4) empowerment; (5) order assignment (one piece flow); (6) resequencing (task and resources); (7) specialist-generalist (move resources); (8) integration (the entire supply chain); (9) parallelism (parallel-processing); (10) numerical involvement (cutting the number of departments).

The second study was by Harrington [54], who analysed 60 companies in Japan, Germany, the USA and Canada to set a standard for best management practices. The organisations selected were drawn from two major industries - manufacturing (cars and computing), and services (hospitals and consumer banks). He found that only five practices significantly correlated with performance measured in terms of return on investment, added value per employee, and customer satisfaction. The practices revealed by the study were: 1) cycle-time analysis; 2) process value analysis; 3) process simplification; 4) strategic planning (deploying the strategic plan); and 5) formal supplier certification programmes.

One should note that some authors have indicated the broad relationship between process management and organisational management (management systems). That is why it was decided to select these two studies [55]. Although Harrington's study [54] focused on practices throughout the management system, his findings revealed the importance of process management and improvement, and of its strategic planning and implementation. Thus each of the best practices in the two studies can be considered as management sub-systems, although these might be grouped according to certain criteria. Nevertheless, the authors realise that there may be other studies grouping best practices in other management fields.

2.7 The Toyota Motor Corporation business model as a management system archetype

In 2004, Jeffrey Liker published *The Toyota Way*, in which he described the fourteen principles of the company's management system. In it, he tried to find the keys to success of the world's leading car maker. The book was one of the first to take a more integrated theoretical look at companies, embracing the whole of management instead of just its production system. Each of Liker's principles was placed in one of four main categories, which could be considered management sub-systems. Each category began with the letter "P": *Philosophy, Process, People/partners; Problem solving*. The following table shows the relationship between the management system's fourteen principles and the sub-systems proposed by Liker [56]:

Categories (subsystems)	Management System Principles
Philosophy (long term thinking)	1.- Base management decisions on a long-term philosophy, even that expense of short-term financial goals.
Process (eliminate waste)	2.- Create process “flow” to surface problems 3.- Use pull systems to avoid over production 4.- Level out the workload 5.- Stop when there is a quality problem 6.- Standardise tasks for continuous improvement 7.- Use visual controls so no problems are hidden 8.- Use only reliable thoroughly tested technology
People and partners (respect, challenge and grow them)	9.- Grow leaders who live the philosophy 10.- Respect, develop and challenge your people and teams 11.- Respect, challenge and help your suppliers
Problem solving (continuous improvement and learning)	12.- Continual organizational learning through Kaizen 13.- Go see yourself to thoroughly understand the situation 14.- Make decisions slowly by consensus, thoroughly considering all options; implement rapidly

TABLE 1: The categories and the 14 management systems principles of the Toyota Way. Adapted from Liker (2004)

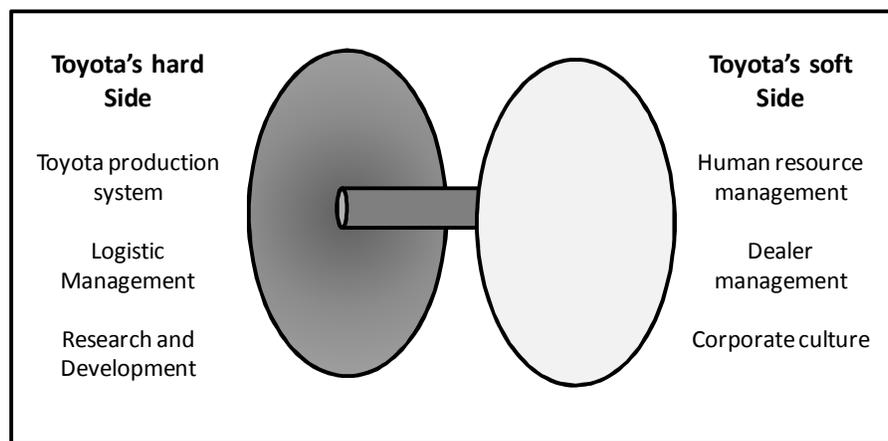
Liker’s work [56] is extremely valuable because it set out to understand Toyota Motor Corporation’s management system and its whole value chain over the years. However, Liker [56] also noted that each one of the sub-systems and its respective principles were also important and that selectively focusing on them could impair the proper functioning of the management system as a whole. As Dahlgaard-Park [6] noted, Liker presented four sub-systems and fourteen principles but that more might be required to attain organisational excellence. Indeed, the author indicated that Toyota Motor Corporation did not require so many sub-systems and principles. Rather, its management system – the Toyota Way (2001) – only set two basic sub-systems: Respect for people and Continuous Improvement or Kaizen [57]. This was intended to make the system easy to put into practice. The complexity identified by Liker was therefore not the way Toyota saw things [6].

In fact, other authors have taken a similar approach to explaining how a company works, looking at the various sub-systems making up a firm’s management approach. For example, Monden [58] indicated that Toyota Production System (TPS) is a viable method for making products because it is an effective tool for producing the ultimate goal – profit. By cutting costs and seeking continuous process improvement and productivity, TPS fosters cross functional management, ensuring compliance with all of Toyota’s strategic policies and targets [58]. According to Monden, TPS can be seen as a integral management system, not just only as production management system, driven by management and strategic decisions to deliver competitive advantage [58]. Indeed, the man who invented TPS, Taiichi Ohno, said as much: Toyota Production System has to evolve constantly to cope with severe competition in the global marketplace.....we have to improve the bottom line (operational profit) of the income statement by considering ‘all aspects’ of the company and ensuring the continuous evolution of TPS. ‘All aspects’ refers not only to problems directly related to manufacturing but also those related to various indirect departments including production engineering, product development, and managerial offices [58].

Following a similar line, Osono *et al.*, [59] presented a conceptual scheme that set out to explain how the Toyota Motor Corporation’s management system operated (although the authors do not use this term) (see Figure 2). According to Osono *et al.*, [59] this scheme is very different from a purely Taylorian company, which learns through doing. Part of the Toyota Motor Corporation manages the “hard” aspects of the company (of which TPS, logistics management, and R&D work are key sub-systems). However, this is balanced by management of “soft” aspects (see the right side of Figure 2), of which human resources, corporate culture, and management of

suppliers and partners are key sub-systems [59]. This two-pronged approach (which combines Taylorian methods and the flexibility conferred by a looser, more creative ethos) seems to be the secret of Toyota's success and what makes it worth emulating [59] [60]. It is possible that the classification used by Osono *et al.*, [59] regarding Toyota Motor Corporation's use of "hard" and "soft" elements in its management system is based on McKinsey's 7-S model, which distinguishes between "hard" components (structure and strategy) and "soft" elements (systems, shared values, skills, staff and style).

Hino [61] explains Toyota Motor Corporation management system in a similar vein (the author refers in a direct way of management system term). He argues that it comprises seven key elements: (1) Total quality control; (2) concurrent engineering; (3) Toyota production system; (4) human resource development; (5) labour-management trust; (6) long-term relationships; (7) long-term relationship with dealerships. Each of these elements can be grouped in the two sub-systems making up the management system: "the management function system, which runs the organizations, and a production function system, which generates products [61]".



Fuente: Osono , E., Shimizu, N., and Takeuchi, H. (2008). *Extreme Toyota. Radical contradictions that drive success at the World's best manufacturer*, p. 20.

FIGURE 2: Hard and soft elements in the Toyota Motor Corporation.

Finally, Dahlgaard and Dahlgaard-Park [62] present a model that is similar to Liker's (2004). It features five critical variables (possible sub-systems) to achieve organisational excellence. These variables are: (1) building leadership; (2) people; (3) partnership; (4) processes; and (5) products. As the authors note, the model follows the principles of Katz and Kahn's open system theory (see Figure 1) [31] and a socio-cultural epistemology [63], in which great store is set by the interrelationships between processes, contingencies, and other parts of the system [6] [63]. From this standpoint, the management system presented by Dahlgaard and Dahlgaard-Park [62] is not a simple mechanism that maintains all of a company's elements unchanged. On the contrary, it drives the firm forward and constantly mobilises new capabilities, ensuring that information flows between management sub-systems deliver incremental improvements in a company's procedures and the way it is run [1] [6] [60] [63].

2.8 The Kaplan and Norton's management system

From another strategic management angle, Kaplan and Norton [36] note that successful strategy execution follows two basic rules: (1) understand the management cycle linking strategy and operations; (2), know what tools to apply at each stage of the cycle. In this respect, understanding the whole cycle from strategy right through to implementation is to understand the management system itself. Kaplan and Norton [36] define a management system as: "the integrated set of processes and tools that company uses to develop its strategy, translate it into operational actions, and monitor and improve the effectiveness of both". The importance of Kaplan and

Norton's work (2008) lies in their finding (supported by various studies over the last 25 years) that between 60% and 80% of companies do not implement their new strategies and thus fail to achieve the forecast outcomes. The authors advocate a closed management cycle to improve the chances of putting the strategy into action. Kaplan and Norton's management system comprises five stages: 1) develop strategy (mission, vision, and values); 2) translate the strategy (objectives and strategic teams); 3) plan operations (process improvement, sales plan, resource capacity plan, budget); 4) monitor and learn; and 5) test and adapt the strategy (cost and profitability reports and statistical analysis) [36].

From a practitioner focus, Kaplan and Norton [36] make a set of practical recommendations for company managers. The end result is a management system that helps: set clear strategies; allocate resources in keeping with the strategic aims; set competitive priorities linked to the strategy in terms of cost, quality, delivery, staff morale and motivation; deliver flexibility; recognise the impact of the strategy on the bottom line; update the strategic aims where necessary. In a nutshell, the management system proposed by these authors strikes a balance between strategic and operational spheres [36]. Nevertheless, as with other approaches focusing on the "hard" part of a company, the management system proposed by Kaplan and Norton does not specifically embrace other sub-systems affecting the "soft" part of the company. In other words, sub-systems such as staff management, staff development, work teams and even leadership are missing from the scheme. This may be because "soft" aspects are not amenable to the kind of measurement and control implied by the Balanced Scorecard approach advocated by Kaplan and Norton.

3. CONCLUSION & FUTURE WORK

3.1 Contribution and Discussion

Reviewing and analysing the literature in our search for management systems has made us realise tough it is to hack one's way through the "management jungle" [4] in search of a suitable theoretical construct. This bears out what various authors have said regarding the difficulties of cutting through the confusion to classify and clarify the various ideas on management [4] [5]. However, we did find writings that helped us grasp the nature of *management systems*. Our interest in this reflection research, based in our scientific curiosity, it is clearly to understand and discovering what constitutes a management system. Besides, this research interest it is also based in our experience with the "reality" of work practice. Therefore, in our experience, many companies are desperately keen to find the path to excellence but they find it strewn with obstacles when it comes to putting strategy into action. Put baldly, many companies fail in their attempts.

For that reasons, after we made a cross themes analysis (based in content analysis) of the various theories, models, and management systems in the quality, excellence and strategy fields, we discovered various common "codes", that represents starting points for defining the management system concept from a more academic standpoint. Also, we realise that it is inappropriate to apply and to generalise these common codes to all management fields, given that we only examined a small sample of theories, studies and models covering quality, excellence and strategy. Nevertheless, these common codes help define and understand a management system, its features and component parts in a first draft attempt.

The following table shows the cross themes analysis of each management theme studied:

Themes studied / Elements of analysis	Taylor	Fayol	Systems Theory	Peters and Waterman
<i>Management field focus</i>	Industrial Engineering	Management / Industrial Engineering	Open Systems Theory	Excellence and Quality
<i>Unit of analysis</i>	Division of work and operating efficiency	General mgmt.	The organisation as a whole	Management excellence
<i>Definition of the Management System</i>	No	No	No	No
<i>Sub-systems</i>	No	No	Includes interrelated sub-systems	No
<i>"Hard" elements</i>	Uses scientific methods and work studies	Division of work into basic operations	Understands the problems affecting sub-system interrelationships	Closer to customers and business realities – constitutes basic strategy
<i>"Soft" elements. Focus on people</i>	Scientific selection of staff and training	Workers must be rewarded	Creates dynamic socio-technological areas	Considers items such as leadership, motivation and participation
<i>Managers' role</i>	To draw up work instructions, plans and tasks	Managers must set an example to their workers	Based on a holistic, integrated vision	Motivates staff to come up with ideas for cutting waste
<i>Strengths</i>	Focuses on work efficiency	Design of the mgmt. process	Sees the organisation as a whole	Profiles excellent organisations
<i>Weaknesses</i>	Forgets the human side	Narrow "hard" focus	Loses sight of the details	Some attributes not applied today

Themes studied / Elements of analysis	EFQM	ISO 9000	Best practices	Kaplan and Norton	Toyota business model
<i>Management field focus</i>	Excellence and Quality	Total Quality	Management and Processes	Strategy and Operations	Management, Processes and People
<i>Unit of analysis</i>	The organisation's self-evaluation	Total Quality in the organisation	Process mgmt.	Strategic mgmt. and operational mgmt.	Excellence, quality and strategy
<i>Definition of the Management System</i>	Yes	Yes	No	Yes	No
<i>Sub-systems</i>	The 8 EFQM criteria	The 8 sections of the norm	Each best practice identified	No	Present in the four models studied. Classified under "hard" and "soft" items
<i>"Hard" elements</i>	The model focuses on mgmt. of work processes and results	The model is based on developing a Quality Management System	Focuses on process improvement and re-engineering	Not considered	These are indicated and cover Production, Logistics, Quality Management and Inter-functional Management systems
<i>"Soft" elements. Focus on people</i>	Considers staff, leadership and partners	Its elements put little emphasis on people's work	Does not consider everything	Not considered	These are indicated and cover staff management, supplier integration and leadership
<i>Managers' role</i>	Management using an established model of excellence	Mgmt. focuses on process quality	Participatory management	Directs the management system as a continuous, closed cycle	Coaching and support
<i>Strengths</i>	Self-evaluation fosters improvement	Documents work	Focuses on work processes and strategy	Strong link between strategy and operations	Stress on processes and problem solving
<i>Weaknesses</i>	Does not say how it should be applied	Can spawn red tape	Does not group all techniques	Forgets the human side	There may be too many principles in some models

TABLE 2: Comparative analysis to define a Management System

It shows how the common codes emerged from a cross theme analysis of the various theories, models and management systems. The first question was: (1) *What is a management system?* As one can see from the table, only the EFQM and ISO 9000 models provide a definition. Kaplan and Norton [36] also do so in their recent article, stressing the management focus they take to link strategy to operations. This finding reveals that the concept of a management system remains ambiguous and is difficult to pin down in theoretical terms, even though its origins lie in classic management theory. In this respect, and taking into account the three definitions found in the literature, one can indicate the following common features:

-What is it?: (a) A general scheme of processes and procedures [38]; (b) a system [46]; (c) An integrated set of processes and tools [36].

-The purpose of the Management System as stated in the definition: (a) to ensure the organisation carries out all the activities needed to reach its objectives [38]; (b) to establish the policy for meeting the objectives [46]; (c) to lay the strategy and turn it into action, and to monitor and improve both the strategy and its implementation [36].

-Additional elements: (a) Includes both macro hard and soft elements [59]; (b) Has independent, interrelated sub-systems [24] [56] [62]; (c) an effort is made to stick to competitive priorities by linking strategy with operation [36].

Bearing in mind these three codes, we propose the following preliminary definition of what constitutes a management system: "It is a set of sub-systems that may be considered work processes (whether independent or interrelated) and which may be placed in either the "hard" or "soft" dimensions of the system. Each sub-system is managed with a view to achieving the organisation's shifting strategic priorities, linking strategy (vision, mission, objectives) with operations."

With regard to our second question, "*What macro-elements make up a management system?*," according to the literature, a macro-element can be understood as a group of management subsystems with two dimensions: one hard and the other soft. This group of macro-elements maintains and encompasses various subsystems which, at the same time, are integrated in other management practices. The aim is for the management system to be operated and applied within the organisation. The following rules emerged from the literature review:

-The *Hard* dimension: (a) processes and operations; (b) strategy; (c) problem-solving tools, process re-engineering and Kaizen continuous improvement; (d) philosophy; (e) resources and inputs; (f) activities, tasks and procedures; (g) quality and production systems; (h) products and services (i) R&D and the incorporation of technology (j) simple organisational structures [9] [19] [24] [35] [36] [37] [46] [53] [54] [56] [59] [61] [62].

-The *Soft* dimension: a) Leadership; b) focus on people (development and empowerment); c) integration with suppliers; d) cultural elements of the organisation; e) a client-based approach; team work (improvement teams) [35] [37] [46] [56] [58] [61] [62] [67].

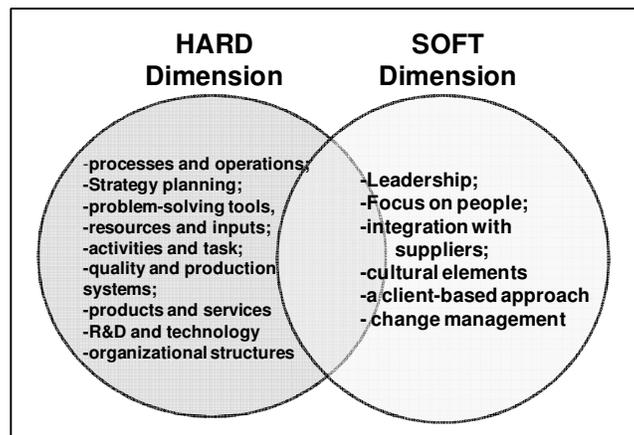


FIGURE 3: The macro-elements of Management Systems.

With respect to the third question, “*What subsystems make up each of these macro-elements?*,” each macro-element consists of certain management subsystems as indicated in the previous paragraph. A management subsystem, in turn, can be seen as a set of managerial practices used by an organisation to manage itself (Planning, Organising, Leading and Tracking). An excellent analogy making the relationship between the macro-elements and the subsystems clearer and more easily understood is the human body. The latter is a biological system which can be classified into macro-elements: the circulatory, respiratory, nervous, digestive and endocrine systems, amongst others. Each of these macro-elements also contains subsystems. For example, the nervous system includes the nerve cells in the brain and the nerve endings throughout the body. Another example is the circulatory system which includes the heart and all its valves (representing a subsystem within this macro-element in and of themselves), as well as the network of arteries, veins and capillaries. Another simple analogy which may help to clarify the relationship between management systems, macro-elements and subsystems is a biological cell. Each cell (an organisation) systematically carries out its biological processes, interrelating each and every one of its elements and subsystems. A cell’s macro-elements could be the nucleus, the mitochondria, the cytoplasm and the cell membrane, and we could find biological subsystems working in each of these. For example, in macro-elements such as the nucleus, we find subsystems or processes to duplicate genetic material, while in the mitochondria we find processes to generate energy for the cell.

To summarise, we considered the two common codes found in the literature in relation to our questions and found that a management system may be made up of the four main macro-elements, which can then be used to group the various sub-systems:

- 1) *Strategy/Philosophy;*
- 2) *Processes/Tasks;*
- 3) *People;*
- 4) *Tools and Techniques*

Firstly, we have the *Strategy/Philosophy* macro-element within the *hard* dimension. It encompasses all managerial practices or subsystems related to planning and philosophy (values and principles). As such, it includes the organisation’s *Vision, Mission* and *Values*. Similarly this macro-element also includes the company’s organisational structure. This macro-element could thus be represented as the management system’s “brain,” long-term thought, its direction, principles and the way in which the company organises itself. The following figure illustrates this macro-element with its respective subsystems.

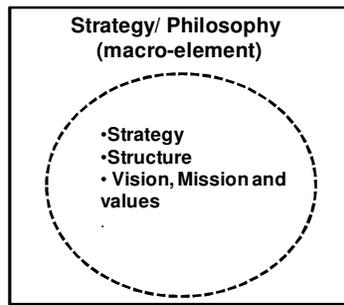


FIGURE 4: The *Strategy/Philosophy* macro-element

Another macro-element within the *hard* dimension is *Processes/Tasks*. Within this group we find the macro and micro processes which are management subsystems, in essence, due to their representing a set of tasks which transforms inputs into outputs internally (within the organisation) and which, simultaneously, interrelates with others in system dynamics, creating a set of nested processes [65]. In line with the analogy used for the previous macro-element, these (macro and micro) processes represent the organisation's "heart" because the entire flux of the products and services aimed at a client or end depend on it. The following figure illustrates this macro-element.

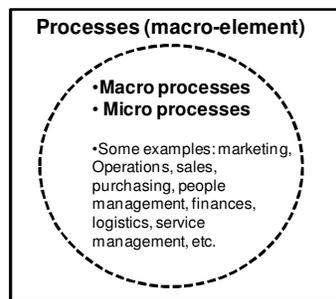


FIGURE 5: The *Processes/Task* macro-element

The third macro-element is *People* and it corresponds to the *soft* dimension. Within this macro-element are all the subsystems or managerial practices related to the company's soft dimension; human factor management and development, leadership management, change management and culture are some examples of the subsystems it includes. In keeping with our analogy, people represent the "human body" within the management system. This macro-element is vital in 21st century firms given that no management system can work, let alone improve, without people. The following figure illustrates this.

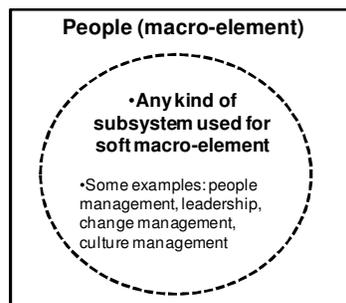


FIGURE 6: The *People* macro-element

The last macro-element analysed is found within the hard dimension: *Tools and Techniques*. This macro-element includes all the techniques and tools used by any subsystem within the above macro-elements to maintain and innovate the management system. Examples include: service quality, marketing, relations, improvement teams, process re-engineering methods, measurement tools (balanced scorecard), leadership techniques and coaching, Kaizen-like problem-solving methods, and strategic planning techniques. This macro-element can be seen as the “hands” of the management system, the reason being that the hands are one of the human body’s main tools. The following figure reflects this idea.

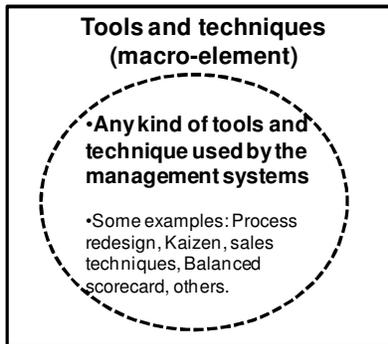


FIGURE 7: The *Tools and techniques* macro-element

With regard to our fourth question - *What management characteristics does a management system have?* – we looked at common codes matches indicating a management system’s main features:

- It takes a simple yet practical holistic approach to management.
- It comprises macro-elements that group sub-systems, striking a balance between “hard” and “soft” dimensions when it comes to practical execution.
- It comprises interrelated sub-systems (which can also be seen as managerial practices) that enable the management system to operate.
- The management system allows daily maintenance and improvement of organizational processes.
- Its purpose is to ensure the company’s competitive priorities are met in terms of quality (Q), cost (C), delivery (D), flexibility (F) and innovation (I), this competitive priorities are already formulated in the strategic planning of the organization. Its ultimate purpose is to achieve organisational excellence.
- The *soft* element (a focus on people) plays a crucial role in putting a management system into effect. We are convinced in the light of the literature review that understanding the full range of management realities in a company means embracing cultural/change management and adopting a people-friendly approach (respect, staff development and retention). It is highly unlikely that a firm today will achieve organisational excellence without such an approach. Accordingly, the real challenge facing 21st century companies in their quest for excellence is to ensure that their “soft” sub-systems (i.e. the human element) reduce the negative impact of “hard” (read mechanistic) elements on the firm’s staff.
- Lastly, benefits reported by literature, which can bring to an organization equipped with an effective management system ranges from managing social, environmental and financial risks; improving efficiency and operational effectiveness; reduce costs; increase the satisfaction of customers and stakeholders, achieve and promote continuous improvement and innovation, to protect brand and reputation, achieve consistently successful and flexible strategies, and bring clarity to the market.

The following conceptual framework condenses and synthesises all our conceptual analysis of macro-elements and subsystems:

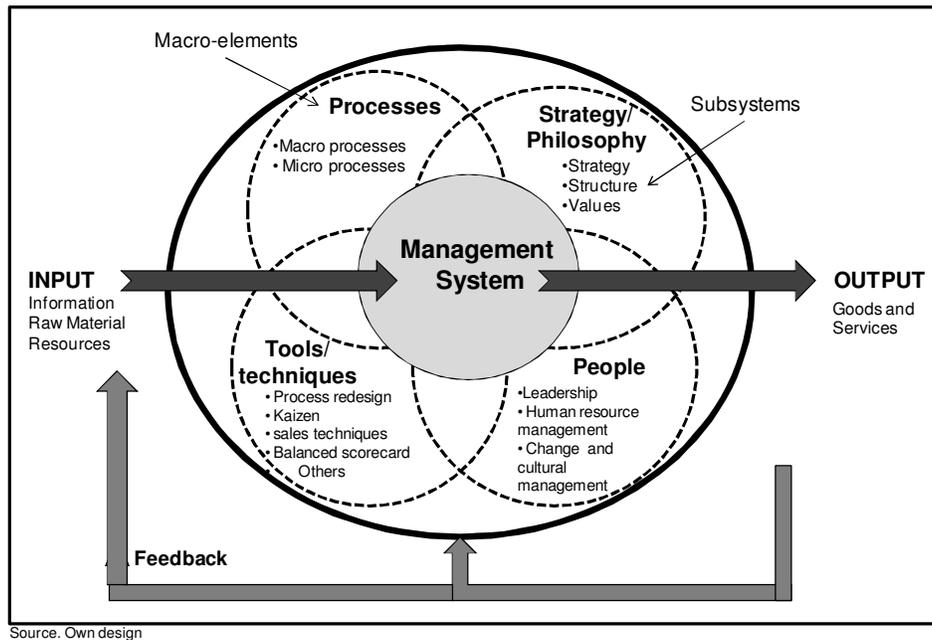


FIGURE 8: A management system framework

When describing the operational dynamics within the conceptual framework, we should observe the management system's focus in Figure 9. It is holistic in terms of operation and design. In fact, it is in line with the open system model proposed by Kast and Rosenzweig [24] as shown in Figure 1 above. In other words, it has a group of inputs which, by operating the macro-elements and subsystems, are transformed into outputs such as goods and services. This transformation is carried out by managing the organisation itself. Specifically, it begins in the management system's hard dimension with the interrelation of its strategic macro-elements and the processes for their application (the dotted-line circles in the figure represent this application), all the while attempting to establish a close bond between strategy and operations. At the same time, during the business management process (management system operation), the People macro-element (within the soft dimension) works to provide a sense of purpose and direction to all the people working there. Lastly, each time a subsystem is operated, any tool within this macro-element can be used. For example, if the company begins to apply a process innovation programme, it can use techniques such as process redesign.

3.2 Final Conclusions and Managerial Implications

"Management Systems" is a term that is still hard to find in the management literature. This research aimed to hazard a definition of such systems and to identify their macro-elements, subsystems and characteristics. A conceptual framework was produced to depict our findings in graphic form. Finally, one should note that a possible limitation of our research lies in its small (albeit representative) sample of management models, conceptual schemes, theories and systems in the quality, excellence and strategy fields. Accordingly, our findings do not permit empirical generalisation of management systems, although an analytic generalisation could be presented on the basis of the evidence found of our content analysis. Furthermore, this approximation needs to be refined if future avenues are to be mapped. Such studies might be of a qualitative or quantitative nature and either confirm or re-work the concept (definition, elements, characteristics) in the light of modern or XXI centuries companies' application of the conceptual framework proposed in this conceptual research.

At least four practical implications of this conceptual analysis can be identified, possibly underscoring the importance of management systems in organisations and answering a basic question such as “How am I going to manage my organisation?”:

- 1) Executives and managers must understand the importance of having a management system which represents the means or how to apply the organisation’s business models.
- 2) In addition to serving as the means to apply the business models, it is the primary vehicle to link strategy with operations.
- 3) Management systems not only represent the execution of general practices (subsystems) within the hard dimension (processes, structures, tasks and activities); they also integrate the organisation’s entire soft dimension (people management, culture, leadership and change) which is generally forgotten in the systematised management of organisations.
- 4) It allows executives and managers to organise and prioritise their management tasks from a systems perspective, abandoning the “old” ways of working as per classic theory (mechanistic organisations).

We want to close this paper with one of the responses that makes Gary Hamel academics and businessmen that have generated from his article “Moon Shots for Management” in Harvard Business Review indicated below: “The challenge in reinventing management is to create systems and processes that encourage employees to bring their very best to work. The goal is to make organizations that are as adaptable, innovative, and engaging as the people who work within them, and accomplishing that will require making organizations feel like genuine communities instead of hierarchically structured bureaucracies [66]”. The Hamel’s response in Harvard Business Review matches the conclusions found in our research and begin to emerging trends in the management for the future.

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