Process Management and Organizational Structure in Large Brazilian Companies: Multiple Case Study

Heitor Mansur Caulliraux

Associate Professor, Industrial Engineering Department and Production Engineering Program

Rio de Janeiro Federal University

PO Box 68.507, Rio de Janeiro, Brazil

Tel: 55-21-2562-7415   E-mail: heitor.caulliraux@gpi.ufrj.br

Thaís Spiegel

PhD Student, Production Engineering Program, Rio de Janeiro Federal University

PO Box 68.507, Rio de Janeiro, Brazil

Tel: 55-21-2562-7415   E-mail: thais.spiegel@gpi.ufrj.br

Adriano Proença

Tenured Professor, Industrial Engineering Department, Rio de Janeiro Federal University

PO Box 68.507, Rio de Janeiro, Brazil

Tel: 55-21-2562-7415   E-mail: adriano.proenca@gpi.ufrj.br

Abstract

The main proposition of this paper is to show how large Brazilian companies, the biggest in their sectors, address process management within the traditional organizational structures (functional, by product etc.), as well as advance in conceptual explanations for that which is found in the field. It is based on a bibliographical revision about processes and organizational structures and a group of six case studies, in a sample which is consistently defined, and with a structured survey protocol. The results presented in this paper are a part of a larger Research Project, initiated in 2011 and which should continue until the end of 2012. The cases describe the actual solutions that are being adopted by large Brazilian companies, as well as the motivations for these. The solutions can provide valuable insight for other large organizations.

Keywords: Process management, Organizational structure design, Case studies of large Brazilian companies

1. Introduction

The study of organizational structures (how the intra-organizational work is divided and coordinated) is very old, eventually as old as civilization itself. Production Engineering (Note 1), our principal conceptual approach, has dealt systematically with this theme since the beginning of the 20th century (Taylor, 1911; Fayol, 1977 etc.). In a simplified manner, the design of an organization was done, at that time, by taking into consideration the following: the number of employees in the organization; the extent of control applied to each part of the organization (in function of the activities realized); and the use of functional logic to aggregate activities; defining which were the line and the staff functions (Carson, 1967; among others). This project method was adopted mainly in manufacturing organizations, until the post-war years (50's decade).

From the point of view of Production Engineering, various factors have contributed throughout the century to the need of reviewing the project proposals described above. As examples we can cite: the growing size and complexity of the organizations (in terms of employees, product lines, markets served etc); multinational operations, technological advances in increasingly fast rhythms; etc.

According to Galbraith (2010), in the middle of the Sixties, some of these organizations, pioneers in technology, have redefined their structures in a matrix of two dimensions, aiming to deliver new technologies with even greater

speed. Later, organizational structures have begun to contemplate other dimensions, such as: geography, market segment, process, among others. A large group of authors have been huddling over these themes (Pfeffer, 1997; Galbraith *et al.*, 2003; Baligh, 2005; Burton *et al.,* 2005; Anand & Daft, 2007; Burton *et al.,* 2008; Bollingtoft *et al.*, 2009) and their ramifications in organizational projects.

Due to the increase in size and complexity of organizations, diverse coordination mechanisms besides direct hierarchy have been designed and implemented. Among these mechanisms are the so-called business processes. The first authors to define these business processes were Davenport (1992), Hammer & Champy (1993), with seminal papers by Davenport & Short (1990) and Hammer (1990). In a simplified manner some authors would say that the organization charts define the structure of the organization and the processes define how these same organizations function. The relationship between processes and organizational structures has been studied by numerous authors, among them Rummler & Brache, 1995; Galbraith *et al.*, 2003; Harmon, 2003; Roberts, 2005; Rummler & Ramias, 2010; Hammer, 2010. Palmer (2007) presented numbers and tendencies that reinforce a growth in demand for the concept of process management.

In the face of this context, this paper presents the results of a study that sought to investigate how large Brazilian companies are being structured organizationally and addressing process management within their traditional organizational structures, as well as advancing in conceptual explanations for what is found in the field. This investigation is presented in this paper organized in 5 sections. After this brief introduction there follows a chapter resulting from a review of the literature about organizational structure and processes. After the theoretical formulation, the larger study where this study fits in is presented as well as the methodological aspects and definitions of the strategies used to conduct this research. In the next chapter we investigate the cases. In this chapter the concrete solutions being adopted by large Brazilian companies are explained, as well as their motivations. Finally, some considerations and unfolding from both, the conceptual point of view and the design-based one are woven, once again under the perspective of Production Engineering.

2. Theoretical reference: organizational structure and process management

As stated in the introduction, some theorists on organizational theory have produced explicative and / or prescriptive models dealing simultaneously with processes and organizational structure. One way to understand the coordination among the units of an organization is through the vision of its processes (Rummler & Ramias, 2010).

Process study has been always required by the organizations (Rosemann, 2006). From an historical point of view, this perception could be supported by the evolution of organizational management periods. For simplicity, in the present study we will address two periods that would obey two management paradigms: the Paradigm of Operation Improvement and the Paradigm of Process Improvement.

The first period occurs after the first Industrial Revolution, when the manufacturing division of labor was an important milestone for the increase of industrial productivity. The Paradigm of Operation Improvement, however, takes shape from the advent of Scientific Administration, at the end of the nineteenth century. There is a kind of organizational design in the context of this paradigm, as can be seen in Carson (1967) *et al.* mentioned in the introduction of this article.

In the paradigm of process improvement, it is verified that the logic of the previous paradigm, which treats the process as a set of operations, leads to "a false supposition that improving operations will automatically conduct to a process improvement and, consequently, of the Production System" (Shingo, 1996: 221). In this new Paradigm, a sharp difference is established between the goals directly related with process improvement and the economic consequences arising there from, and the measures, which are often related with operation improvement, although always considering the increase of process performance as a whole. However, a method for a specific organizational design project, derived, for example, from the Mechanism of the Production Function, representation proposed by Shigeo Shingo for the functioning of production activities, does not exist in the framework of this paradigm.

Nevertheless, the first decade of this century is witnessing a new rush of organizations towards process concepts (Smith & Fingar, 2003), after the first wave generated by the millennium bug and the massive implementation of ERPs within the organizations. And this rush focuses on, among other objectives, the relationship between processes and organizational project.

One of the oldest and best known models dealing simultaneously with processes and organizational structure is described in Rummler & Brache (1995). The authors enhance that process orientation allows identifying improvement opportunities, which are generally at the functional interfaces, where there is a flow or transference of tasks and necessary information for the process to be continued in other areas (Rummler & Brache, 1995). Figure 1 shows the authors' synthesis of the organization, process and activity levels.

Insert Figure 1 here

Figure 1: Analysis levels. Source: Rummler & Brache (1995)

Recently, Paul Harmon, following the concept of analysis levels of Rummler & Brache, presented the objects that a manager must analyze for process management. According to Rummler & Ramias (2010), all organizations are systems that exist to produce valued outputs (desired products or services to customers and economic returns to stakeholders). All organizations need to be adaptive systems existing inside a larger Super-System, and in order to succeed over the long term, organizations need to continuously adapt to the changes in their Super-System. The Super-System is the ultimate reality and performance context for every organization.

Insert Figure 2 Here

Figure 2: The organization, its processes and activities. Source: Harmon (2003: 131)

Another relevant model that somehow connects organizational structure and processes is the Star Model according Galbraith *et al.* (2003). These authors developed a handbook of organization design. All the star vertices should fit each other. Process role appears as a key element of the organization design. This understanding appears in Galbraith *et al.* (2003). However, the proposed method does not prioritize process understanding as one of the first activities to be conducted when designing an organization.

Insert Figure 3 Here

Figure 3: Star Model. Source: Galbraith *et al.* (2003)

In a recent article, Paim, Caulliraux & Cardoso (2008) suggest a model to describe how the elements of process management articulate with traditional functional management. Figure 4 illustrates 8 management dimensions, synthesized after an extensive bibliographic review. A particular organization may choose to position itself in a more process-oriented way in a sub-set of elements, and in a more functional manner in the remaining dimensions. It is important that this management decision ensures the intra-model fit, as well as the fit of this competitive model adopted by the organization. Choices are not infinite. In the present paper, such issues will be incorporated in the case analyses, where actual choices of the sampled organizations are illustrated.

Insert Figure 4 Here

Figure 4: Functional process management vs process oriented management. Source: Paim, Caulliraux & Cardoso (2008: 709)

Organizations have tried varied solutions to define the kind of process management they should adopt (Caulliraux & Spiegel, 2011):

- Each unit functionally takes care of a macro-process. It is assumed that a corporate unit produced the organization's process map and that the board assigned each macro-process to a director, manager, sector, etc. The case of the IEC, reported in this paper, is an example of this approach.

- The processes are broken-down and allocated to functional units with lashings through service levels agreements (direct or reverse). It is assumed that a corporate unit produced the organization's process map and that the board allocated parts of the processes in specific units. In this case it is important that the variable remuneration system is linked to the global performance of the organization. This solution has been adopted, for example, by the BSMC of the studied sample.

- Leaders or informal groups are in charge of the coordination of transversal processes (in analogy to the weak matrices of the project management theory (Clark & Fujimoto, 1991));

- Creation of process units ("offices") that analyze the processes and negotiate them with functional managers. This solution format is discussed in Jesus *et al.* (2010), and found in the example of the ARTDC in this paper.

- Actions specifically defined and designed, but with local process applications and unfolding (for example, resource allocation and budgeting). This solution is addressed in the case of the CDONPP.

- Development of generic models and local adoption depending of each manager's will. This manager is responsible for conducting a "from-to" with the functional organization. This solution appears in two cases of the present research sample: the CDONPP and the ARTDC, showing that some of the solutions presented in this paper include composite models.

Note that Figure 4 above, dully marked for each case, could graphically represent each one of the above mentioned situations. That is, it could be a graphic representation of decisions managed in a process way in a particular

organization.

More recently, Vom Brocke & Rosemann (2010) based on consolidated BPM literature, proposed six core and critical elements for process management. This synthesis, a consensus within the process community, includes the organization of the community's most recent handbook. The convergence of these 6 factors critical for process management with the elements that the Organizational Theory indicates what should be addressed in the organizational design, what should be enhanced. The previously mentioned Star Model of Galbraith *et al.* (2003) is an example of large overlapping of these elements, and the PARC of Roberts (2005) could also be added to the list, among others. Therefore, there is no doubt in the literature on the close relationship that should govern organizational design and process management.

Insert Figure 5 Here

Figure 5: The six core elements of BPM. Source: Vom Brocke & Rosemann (2010)

3. The study

3.1 Contextualization of the Economic Scenario

During the last decade-and-a-half, the Brazilian economy has been showing notable progress in terms of evolution of its institutions and public policies. In association with the inflexion of the international macro-economic framework and the rise of the Chinese economy, it began to show, beginning 2003, significant growth rates, and everything suggests that this is sustainable in the short and medium-term.

According to the World Bank, the GDP of Brazil was USD 500 billion in 2002 and rose to USD 2 trillion in 2010 (World Bank, 2011). This spectacular growth was accompanied not only by the growth of its principal companies, but also in terms of a greater complexity of these same and the entire production scale (with the multiplication of numerous types of enterprises), and a greater sophistication in the way their operations and supply chains are organized.

The challenge of dealing with a more dynamic and more complex environment brought with it large-size tensions to the management of these organizations. Stress is especially inevitable when talking about the usual forms of vertical and horizontal division and coordination of labor, on an intra-organizational level as well as in its relation with suppliers of all types.

In this context, during the last few years executives have shown a renovated interest in a traditional issue: the design and the adjustment of OS. Although there has been a certain sense of "subject dominated" in the academic literature, field surveys suggest from the outset that people have been enormously avid to discuss the theme in the current Brazilian context. The study, which this article reverts to, arose from the desire to search and systemize answers, with the urgency characteristic of a developing economy that does not know how much time it has to try to escape the middle-income trap in which it finds itself, given the window of opportunity History has proportioned.

3.2 Methodology

Research methods are the bases for the creation of knowledge, being the instruments used to understand reality (Pinsonneault & Kraemer, 1993). To investigate how the companies project and manage their OS, an exploratory methodology (Jonsen & Jehn, 2011) was adopted, in place of the formal procedure of hypothesis test. Firstly, because the objective was to gather descriptive information on the practices used in these large corporations, and secondly, because there is little literature dedicated to the discussion of project and management. What is being sought is, exactly, to develop an empirically efficient theoretical-conceptual perspective (Mason, 2006) to orient the designers and decision-makers in their confrontation with the demands of the competitive reality. Although there is vast literature about "organizational change" and "adaptation to changes in the business environment", little has been studied focusing the question on organizational redesigning, incremental or not, from the Production Engineering perspective.

To gain insight into how the different characteristics of the corporate management models interact and inter-relate with the development of its organizational project, and about the different approaches and instruments used effectively by the organization to redesign its OS, we adopted the Multiple Case Study (Yin, 2005: Eisenhardt, 1989) as the methodology, in the context of an ample literature review.

3.3 Object of analysis

Bensabat *et al*. (1987) emphasized the relevance of defining the most appropriate analysis unit for the study. Different units of analysis mean distinct forms of data collection and results and conclusions that can be extracted from the research (Patton, 2002). For the author the key point in selecting and making decisions around the units of analysis is in the definition of what we hope to be able to say at the end of the study.

OS defines the units an organization will have and the relation among them. It can have varying degrees of aggregation: from the organization as a whole to the positions that individuals / employees occupy (Baligh, 2005). More recently, the questions of third parties and, consequently, their management via contracts, has become critical, and should be incorporated to the list of important themes in OS. This issue is critical in all its formats (Hollow Organization, Modular Organization and Virtual Organization) and is presented by Anand & Daft (2007) as Era 3 of Organizational Design.

For some who seem to be little informed in the vision of the authors of the present paper, OS are elements of lesser importance in these times of networks and communities (Bollingtoft *et al.*, 2009), among others. This posture is dangerous, besides being naive. The OS, not in an isolated manner, defines the lines of authority and responsibility of an organization (Burton *et al.,* 2008). This means it defines the locus of power to allocate resources, to increase or decrease personnel, to define the paths and/or strategies of the organization (Burlton, 2010).

These formal structures are complemented by a myriad of arrangements that assist in the daily affairs of the organizations such as commissions, committees, communities of practice, and formalized organizational processes (Markus & Jacobson, 2010). The weaker the organization is designed, the greater the relative importance of these arrangements and the greater the number of these same, which will always exist to some degree (Galbraith, 2010).

3.4 Research protocol

For Yin (2005), the protocol is much more than a simple instrument to gather data. The author emphasizes that the existence of a protocol is fundamental, especially in the case of a multiple case study. This instrument should include a general vision of the case study project (Mason, 2006), field procedures, the questions under research and that the study intends to answer, and a guide for the elaboration of the case study report (Yin, 2005).

The research protocol considers a set of questions to be worked together with the company interlocutors, and orients the collection of documents and evidence. The central questions of this study were: the OS of the company; the criteria used; concepts and theories behind the OS (Anand & Daft, 2007), theories that their formulators used (Burton *et al.,* 2008); the degree of OS formalization (Galbraith, 2010); coordination mechanisms; role of process management in the context of the organizational design (Paim, Caulliraux & Cardoso, 2008); history of the structure (Bollingtoft *et al.*, 2009); main norms / regulations of the sector impacting OS; guides and reference models (Spiegel & Caulliraux, 2012), etc., about OS in the organization; etc.

Some complementary questions rapidly emerged as central to the study and were incorporated to the protocol. Listed are: Responsibility and Incentive (Armstrong, 2010); the relation between the OS and Strategic Management (Galbraith *et al.*, 2003); the fit of the OS with the performance of the organization, and how this is measured (Roberts, 2005); etc. In this article, as already stated, the central point is to describe the organizational solution adopted by the company, from the schematic representation of the OS, and to show how it has been approaching process management.

3.5 Study sample

In terms of the cases selected, the focus of the study is on the biggest and most relevant Brazilian companies in the selected sectors. To comprise the general sample of the entire project the following criteria were used: National; biggest in its sector; Numerous organizational units, although geographically separated; Growing internationalization process; Presence of structured management models, typically encompassing diverse integrated reference models (Spiegel & Caulliraux, 2012); New markets demanding innovation; Strong growth; Participation in organizational networks; and insertion in political / governmental networks with non-negligible interference in the sector and management.

For Einsenhardt (1989), even though there does not exist an ideal number of cases, any number between 4 and 10 cases is generally reasonable. According to the author, with less than 4 it is generally difficult to generate theory with greater complexity, and it is difficult to have empirically sufficient evidence. With more than 10 cases, it begins to get difficult to deal with the complexity and volume of information.

In an initial evaluation, there was a map of approximately 20 companies with potential to be studied. Of these 20, 8 have been visited. The cases completed until this point in time include 6 companies. The results achieved, especially those related to the question of the OS's and the approaches of process management, are presented here.

Insert Table 1 Here

Table 1. Companies studied

4. Cases

4.1 Company for the Design and Operation of Nuclear Plants

The Company for the Design and Operation of Nuclear Power Plants (CDONPP) was created at the end of the 90's by joining the Design area of nuclear power plants of the Nuclear Company and the Nuclear Directorate of the Company for the Generation and Transmission of Energy. Subsidiary of the Brazilian Company of Electric Energy, its aim is to operate and construct thermonuclear plants in Brazil. It responds for the generation of approximately 3% of the electric energy consumed in Brazil. The capital of CDONPP is 6,5 billion USD. Its net invoicing in 2010 was 1 billion USD. Currently, it has 2,500 employees and more than 1 700 outsourced.

4.1.1 Organizational Solution

CDONPP structure is represented in Figure 6.

Insert Figure 6 Here

Figure 6: CDONPP's Organizational Solution.

Through the organization chart of CDONPP, one can perceive that various sub-organizations exist, each with a specific operational logic. The Directorate of Plant Operations and Commercialization is responsible for the operation of the plants themselves, having strong standardization, rigidly controlled innovation circuits, participation in numerous national and international forums etc. The Directorate of Finances and Administration: responsible for the bureaucratic machine of CDONPP, a classic functional organization. The technical Directorate is organized by projects, with relatively autonomous teams, high budgets (the budget for the design of Plant 3 is greater than the remaining company budget), strong use of reference models (PMI / PMBok) etc. The Directorate of Planning, Management and Environment is responsible for the support of the OS, strategic planning etc. This area has to maintain organizational consistency through numerous mechanisms. In this effort the Guidelines of the Holding Company, including indicators and unfolded goals, play an important role

4.1.2 Process-oriented Approach

The Superintendent of Planning, of the Directorate of Planning, Management and Environment, is responsible for the activities of organizational structuring. The Directorate has 5 people allocated only to support the construction of the process maps, which are the basis for management improvement promoted by the Superintendent, but that really depends on the adhesion of the other areas of CDONPP, The method developed and applied by the Superintendent begins with the definition of Operational Nuclei. With the nuclei defined, they make o map of the processes of the nuclei and between the nuclei. To these, they associate indicators, which are also coupled to those of the Brazilian Company of Electric Energy.

The Superintendent of Planning discloses the indicators on the intranet, making it possible to accompany the performance of the Organizational Unit (OU). Analyzing the performance, the Superintendent of planning defines action plans together with the OU. The OU designed in this manner is managed via processes. Such approach impacts the budgeting of the unit, in defining the human resources profile (which ends up being process oriented), in defining the goals linked to variable remuneration systems, among others.

Insert Figure 7 Here

Figure 7: CDONPP's method.

4.2 Agricultural Research and Technological Development Corporation

The Agricultural Research and Technological Development Corporation (ARTDC) was created in the beginning of the 70's. Its mission was to "make feasible research, development and innovation for the sustainability of agriculture, to benefit the Brazilian society." Currently, it has a capital of 62 million USD, 9 500 employees, of which 2 250 are researchers – 18% as Masters 74% with Doctorate and 7% as post-Doctorate. The budget for the Company in 2010 was 1 billion USD and its main product is Agricultural and Cattle raising Research and its principal service is Technology.

4.2.1 Organizational Solution

The ARTDC is organized as shown in Figure 8.

Insert Figure 8 Here

Figure 8: ARTDC's Organizational Solution.

ARTDC is constituted by a functional structure on the corporate level and by four basic configurations in their decentralized units, or centers of research and development. The corporate level is composed of the following 3

executive directors: Transference of Technology, Administration and Finance, and Research and Development; with subordinated central units (CUs). There are CUs also subordinated directly to the president. Generally speaking, the CUs have a normative and advisory role.

The Decentralized Units are approximately 50 Research Centers, classified into 4 types (Eco-regional, product research, services and "basic theme" research). These are geographically dispersed and act as partners among themselves, with universities and the private market. There is an important internal market mechanism in action: the official announcements, the means used to publish the lines of research of interest to the ARTDC, together with other relevant aspects for the selective process (characteristics, specific financial budgets, duration, the projected goals and objectives to be reached). After the bi-annual publication, the process of induction effectively begins within the company; knowing the "Call", the teams of researchers at the Research Centers begin to establish internal and external partnerships, and elaborate project proposals. The proposals mailed are evaluated bearing in mind the prioritization and selection of these by the Corporate Group.

4.2.2 Process oriented Approach

The Strategic Management Secretariat (SMS), a central unit linked to the president, is responsible for the changes of organizational structuring, strategic planning and management development. There is a staff of 50 people working there. According to the report of those interviewed, apparently the SMS has a process-oriented vision.

As the history of the ARTDC involving process subject, the person interviewed related that the beginning goes back to the 90's with the quality movement. After the disarticulation of the quality programs, the vision for processes continued as a technical initiative of a group (which was not SMS). At that time, process improvement was a part of the goals of the award system (which represented 1.5% of the payroll). Some centers perceived this as an opportunity for improvement and worked their management processes; others only followed to fulfill goals.

Currently, process improvement is not among the corporate goals; process initiatives are conducted in a decentralized way. The intention of the SMS is that this movement arrives at all the Centers, each in its own rhythm. With the development of the Integrated Management of Systems and Processes, and the conception of a "Process Office", which would be responsible to propose process management models, the SMS believes in the effective implementation of a model of corporative management of process management, acting at the edges. For this, the SMS developed a method to analyze and improve processes. The Units could use this method or adaptations to it, and it would be up to the SMS to assume a more consultant role (and not deliberative).

Another example of the process-oriented vision of the ARTDC is the project for mapping the complexity of the Centers and establishing guidelines for process and organizational structure design, conducted by the SMS as one of its present challenging tasks. Initially the Centers were categorized in 5 types, in function of their size, from small to very large, and the complexity of the objects dealt with from low to high. Beginning with this definition of size and complexity, they evaluated how many areas the Centers of each type would need, and how many functions would be destined to them. Each area has different functions and each function (or role) has an associated process. That is, there is a process logic for each type of Center, but not how it affects each of the Center's management. Using the procedures of the Centers as a basis, they defined decision criteria, as, for example, to break down into 3 areas because the process is very large, or to centralize because it is too small. From this study, there emerged a first draft proposal of designing rules, for process "a" to have up to "x" areas because the Unit is a type "1". This "manual" is yet to be tested and implemented.

4.3 Design and Engineering Company

The Design and Engineering Company (DEC) is a Brazilian engineering company constituted in the 60's. It was created as a consortium between a Brazilian company and an American one for a large construction project in the southeastern part of the country. After the conclusion of the project, other clients appeared and the company was not dissolved. In the 70's some engineers took control of the entire company, and offered the stock to the employees. Since that time, 100% DEC belongs to its employees. Currently, there are 1 600 people of which 80% have completed university and 80% are stockholders. Its invoicing for 2010 was 1 billion USD.

4.3.1 Organizational Solution

DEC is structured from a corporate structure, four companies, two institutions and a foundation

Insert Figure 9 Here

Figure 9: DEC's Organizational Solution.

The operational activities of the Organization are led by four companies. The structure of DEC's companies follows the details in figure 9 for Engineering. The business is done in teams that at any given moment are allocated to

projects or in the elaboration of proposals. The work is always organized in task groups. The technical body is a part of a particular competence center. The concept of "hierarchy" is multiple and variable. An engineer responds to the leader of his group (who is responsible for his developing plan and for establishing his salary), as well as the manager of the project (who evaluates his performance) he is working on, at that moment.

The Director of the companies counts on a team in management systems. This area, like the projects themselves, have no fixed resources, calling on the competence centers when necessary for internal projects. The companies count on a structured Administrative Unit to perform the functions of: Administration and Systems, Finances, Human Relations and Communications. These areas are responsible for the performance of the different support functions needed to realize the business of the company. There are teams and fixed resources allocated to them.

4.3.2 Process-oriented approach

The formalization and orientation of this "type of functioning" of the DEC businesses are oriented by processes. All of DEC's processes are formalized, documented and divulged on the intranet. DEC's body of employees uses the maps of different processes as a reference to execute the tasks which are: management procedures (of leadership, business portfolios, suppliers, brands, etc.) main procedures (commercialization and execution), and support procedures (communication, human resources, legal, systems etc.)

Insert Figure 10 Here

Figure 10: Reference to DEC processes.

4.4 Beer and Soda Manufacturing Company

The Beer and Soda Manufacturing Company (BSMC) was founded at the end of the 90's, with the fusion of two Brazilian beer companies. Today, it is a part of the Group considered the largest beer producer in the world, formed through the fusion and incorporation of other companies from several countries, with more than 200 brands in its portfolio. The Group to which BSMC belongs, in the first trimester of 2010, had shown median EBITDA growth of USD 1 billion during the last 5 years.

4.4.1 Organizational Solution

The organizational structure of BSMC can be observed in the Figure 11.

Insert Figure 11 Here

Figure 11: BSMC's Organizational Solution.

BSMC is organized around Vice-Presidencies (VP). To explain the unfolding logic, we use the VP of Human Resources, in the figure above, as an example. This VP has 5 directories, which are differentiated between Strategies and Business. In the Strategy Directories, which are transversal to the entire structure, there is a relation with the structure of Corporative Management. While in the Business Directories there is a team that takes care of the application of the sales and operations regional units. Within one Regional there is a Regional Human Resources Manager.

4.4.2 Process-oriented approach

The BSMC management solution is composed of "4 management models", according to the Figure 12. In all the models the pillars are supported in the formalization of the processes.

Insert Figure 12 Here

Figure 12: BSMC's Management Models

These models are broken down from BSMC's Management System, which begins with a medium to long-term vision, establishing the strategic formulation and the respective unfolding of goals.

Insert Figure 13 Here

Figure 13: Unfolding the BSMC's Management System.

It is in the execution of the standardized and registered processes that BSMC seeks to achieve the results stipulated in the definition of goals. In this way, the 4 models have the process flows, a description of the activities that should be done to fulfill the goal. The way of presenting the flows is as a macro-flow, where the processes are shown under the responsibility of the areas, as well as the process being detailed.

The process maps are directed to the middle management layers, a reference about the logic of conducting the business and not an operating manual for the employees directly involved with the execution. The models are built in a decentralized manner, by middle management. So, we can see that there is not a strict standard for the modeling of the processes. Many of the processes present different levels of detailing, and the modeling tool used is not uniform.

4.5 Postal Service

The Postal Service (PS) was created during the end of the 70's, with the mission of supplying accessible and trustworthy solutions to connect people, institutions and business, in Brazil and the world. Currently, there are 110 000 people and their total invoicing was 15 billion USD.

4.5.1 Organizational Solution

The structural solution for the PS can be observed in Figure 14.

<center>Insert Figure 14 Here</center>

Figure 14: PS's Organizational Solution.

The structural organization for the PS is represented by the Central Administration, Executive Directors, and by the Regional Administration composed by Regional Directorates. The Executive Directorate of the Company is constituted by the Presidency and by eight Vice-Presidents. There are 28 Regional Directorates in the Regional Administration.

4.5.2 Process-oriented approach

The Planning Department (PLANDEP) is responsible for the OS of the PS, through the Organizational Analysis Management. Currently, this team is organized around three activities, which are: normalization system management, structure conception and emission of expert opinions about the structure and the development of a methodology of process management.

The process movement in the PS began in the regional units in a decentralized manner. Currently, the PLANDEP has the mission of developing a corporate methodology of process mapping. This demand began with a request of the Directorate for PLANDEP parameterizing the structure. That is, to define how many managements, minimum and maximum, compose a department, from which point a management unit should be broken down, etc. Currently they are undertaking the definition of the process mapping method, through the description of the activities in a chosen tool for process modeling. They expect, in the future, to establish the relation between the mapped processes, the work load, and personnel dimensioning

4.6 Integrated Energy Company

The Integrated Energy Company (IEC) is an electric company for the following sectors: exploration and production, refinement, commercialization and transport of oil and natural gas, petrochemicals, distribution of derivatives, electric energy, bio-combustibles, and other sources of renewable energy.   Leader of the Brazilian oil sector, it has expanded its operations to be among the five largest integrated energy companies in the world until 2020. Currently, it is found in 28 countries, and among the three largest energy companies in the world. It has 80 500 employees and the 2010 invoicing was 150 billion USD.

4.6.1 Organizational Solution

The structure of IEC is represented in Figure 15.

<center>Insert Figure 15 Here</center>

Figure 15: IEC's Organizational Solution.

The organizational solution of IEC is represented by 3 directorates that aggregate the targeted functions of the company, which are: Gas and Energy, Oil Exploitation, and Oil refinement; 1 directorate of administration and finances, which, together with advisory services, establish the normative and fulfill the role of the bureaucratic machine of the company. There is also an international directorate, responsible for one of the vectors of company growth; and the services directorate, that serves the rest of the units of the company and houses from the Research Center of the IEC to all the normal service providers passing through the Engineering area. Within the Directorates, the IEC's organization chart conciliates various criteria (functional, by product, geographic and matrix etc.).

4.6.2 Process oriented approach

The IEC has always accompanied and encouraged the movements for Quality, Productivity and Competitiveness. At the beginning of the 90's, with the adoption of certification and standardization systems, it began to apply total quality management, culminating in certification programs at the turn of the century, with a growing focus in quality, health and operational safety assurance. From the beginning of 2000, the Company has lived with greater complexity in its management, due to its growth and the changes in the world scenario, in the general economy, as well as in the expansion of the activities of the major oil and gas companies to other areas of energy industry.

In its Basic Process Management Plan, IEC states that "process governance has the objective to organize, implant

and sustain process management in IEC, ensuring that its improvement objectives and projects are strategically integrated and aligned, improving the performance and the agility of response to change through training and spreading the culture of process management throughout the Company". According to the process governance model at IEC, the objectives of process management have been established from IEC's strategic objectives. To achieve these objectives it is necessary to establish roles and responsibilities on the processes and the process management activities. In turn, these processes are planned and executed based on instruments from practice. These elements are organized by a governance structure, where people associated to the IEC OS will produce and manage the initially planned results. For the model to function, it is necessary to apply control and evaluation mechanisms. The first comprises the assessment of compliance and maturity of the model. The second will contemplate the performance of the people involved in the practice of process management under the eye of the results obtained.

5. Summary and Discussion of the cases

Processes are used as background language, to express relationships and define responsibilities. All 6 companies have adopted process representation as an instrument to describe how the organization operates. This finding holds for Corporations, since large companies were sampled for the present research, but it is not possible to generalize to any kind of organization. Common points among current practices, pursued as objectives of the field research, were basically centered just on the option of thinking by business processes.

Companies are, by choice or because they did not reach their final goals, in different stages regarding: (a) the extent of process mapping in the organization; (b) details of the information in process representations. Each company uses the process language to address different problems. Nevertheless, it is clear the increasing role of process management as an instrument for organizational redesign, even in companies with structures not oriented by processes. All companies have adopted, in one way or the other, modeled processes as reference for their management policies and decisions.

The different solutions for process management are summarized in Table 2.

Insert Table 2 Here

Table 2: Summary of process management in the cases analyzed.

Differences can be observed in relation to: a) conducting structure of process management and allocation of decision and imposition rights; b) accountability for process modeling rules; c) assignment of process modeler; d) uses of modeled processes in terms of which decisions of organizational design should be taken based on them; includes from the division of labor among divisions, departments and centers / units; going through subsidizing decisions of investment and budget allocation, to determining performance, commitment and target indicators, and linking with variable remuneration systems.

The differences seem to be determined by combinations of elements from several origins. More classical aspects, such as the company business and the technological base that dominates its sector (Woodward, 1965); the economic dynamics experienced by the industry where the company operates throughout the years (Lawrence & Lorch, 1967); the "organizational fashion" in force at the time the company was born (Mintzberg, 1979); the profile and beliefs of leaders from the founding of the company and its process of cultural formation (Schein, 1982); among others, certainly contribute to shape the present situation.

But more specific aspects related to the history of the company and its employees on process management should be added. We can enhance, for example: a) the functional area and hierarchical level through which the perspective of business process arrived to the organization, for example, whether by the Corporate level or a Business Unit or through the Administration or Production; b) the role of process management in the context of previous initiatives of management improvement – for example whether in Total Quality or implementation of ERPs; c) the main role pursued by business process management, for example, whether as instruments to promote efficiency, effectiveness or just the best internal adjustment of decentralized Units.

The field work reported in the present paper, however, did not deepen in the diachronic perspective of the cases that were studied. In this sense, the main finding of the research project, which is still in progress, is the popularity of process management contrasted with no evidence of any dominant form of its use. Given that, we may say that the findings don't confirm the existing literature as a reference of what companies are actually doing. The literature remains as a prescription of what the process community believes that the companies should be doing. When one observes the long time management literature took to acknowledge the true nature of, for instance, the practice of strategic management *vis-a-vis* the abundant strategic planning literature of the time, and only then propose management solutions more up to the point, one has to think if our findings in the field would not give some leeway to similar worries.

6. Closing remarks: Organizational design and business process management & engineering

The relationship between processes and OS is a recurrent subject in literature. In this paper, we describe how a significant set of large Brazilian companies, the biggest in their sector, is dealing with process management within their orthodox OS. The methodology adopted was case study, with the limitations associated to the fact that the interviews and document search were conducted from (re) design of OS and only later derived to broader issues of the management models of the companies.

Following this methodological approach, the authors wish that the description of the solutions found, as well as the logic behind them, may provide valuable insights for other large organizations. Notably, we may observe that the Corporate level management tends to have an organizational instance or entity that uses process mapping to shape a common language that underlines many business management discussions. However, the scope of the process standardization to be adopted by each Operational Unit varies strongly from case to case. And the intended use with that extension also varies. Performance evaluation, position accountability, support to local organizational redesign activities, customized for the situation of a particular Operational Unit, among others, were all alternative uses found in the field. There is no clear model or "theory" to relate each situation with the actual process approaches and uses adopted by the companies.

As Caulliraux & Spiegel (2011) points out, organizations have tried varied and composite solutions to define the kind of process management approach they would adopt. In fact, among the present case studies, one may notice: at IEC each unit functionally took care of a macro-process; BSMC processes were broken-down and allocated to functional units with lashings through service levels agreements; ARTDC created a process unit that analyze the processes and negotiate them with functional managers; CDONPP and PS actions specifically defined and designed processes, but with local process applications and unfolding; ARTDC, DEC and CDONPP are developing or have developed generic models, with local adoption depending of each manager's will.

The varied field results do not indicate, or even suggest, a specific process policy as the best to be followed. That is, a standard or indication for the design of a solution for process management in certain organization of type A or B, a draft of "technological rule", does not emerge from the cases analyzed, at least as far as can be seen (Van Aken, 2004).

At least at the level of Organizational Redesign, we may say that the findings will not confirm the existing literature as in use (Rummler & Brache, 1995; Galbraith *et al.*, 2003; Harmon, 2003; Rosemann, 2006; Palmer, 2007; Rummler & Ramias, 2010; Hammer, 2010). The "new process paradigm" does not have yet reached the status of a stabilized paradigm, with a hard core of approaches and propositions. From the Production Engineering point of view, understood as a Design Science (Simon, 1976), Business Process Engineering and its set of concepts and techniques, when related to Organizational Design, seem to have not gone through the broad empiric validation test of success in its application and successful diffusion in the productive fabric. Though the "idea of process thinking" is widespread, the "technology" is still lacking in reaching the maturity and substance of, for instance, time and motion study.

What we can observe is the central role of the business process management in the sense of updating the narrative about organizational structures. In this sense, business concepts in practice are still directly associated to the traditional concepts of Organizational Theory (Pfeffer, 1997; Galbraith *et al.*, 2003; Baligh, 2005; Burton *et al.,* 2005; Anand & Daft, 2007; Burton *et al.,* 2008; Bollingtoft *et al.*, 2009), centered in representing the organization as a project thought (i.e., created) that brings people under coordinated behaviors and actions that ultimately enable the organization to achieve certain goals.

The contemporary discussion on Organizational Theory, however, questions the dualism between the designed structure and the actual dynamic process lived by the organization (Tsoukas, 2005). Indeed, perhaps in the context of a society strongly supported and informed by integrated digital technology, at global, multicultural level, the symbolic raw material that feeds the organizational projects is further complicated to such an extent that neither the mechanic nor the fluid metaphors may be able to handle the needs for a contemporary project of OS.

A review of "management theories" does look to be necessary. Advancing research on the concrete use of process management in the organizations is part of such Research Program: it may be on the edge of the present structural paradigm, where the design rules are not actually defined, that the elements that may lead to a truly contemporary paradigm of OS design can be glimpsed and further developed.

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Notes

Note 1. The Brazilian Association of Production Engineering (www.abepro.org.br), following its American counterparts, define as one of the areas of Production Engineering: "6 - ORGANIZATIONAL ENGINEERING The body of knowledge related to the management of organizations including in its topics strategic and operational planning, production strategies, entrepreneurial management, intellectual property, evaluation of organizational performance, information systems and its management and productive arrangements."

Note 2. The denominations of the companies exposed in this text are fictitious.

Table 1. Companies studied

#	Description of the ACRONYM – centered in the business area (Note 2)	Large area of actuation	Approximate Invoicing (2010 – US$)	Number of direct employees
Organization 1	Company for the Design and Operation of Nuclear Power Plants (CDONPP)	Nuclear Engineer	US$ 1 billion	2 500
Organization 2	Agricultural Research & Technological Development Corporation (ARTDC)	Agricultural Research and Development	US$ 1 billion	9 500
Organization 3	Design and Engineering Company (DEC)	Design and Engineering Services	US$ 1 billion	1 600
Organization 4	Beer and Soda Manufacturing Company (BSMCS)	Beer and Soda Industry	US$ 15 billion	41 000
Organization 5	Postal Service (PS)	Postal Service	US$ 10 billion	110 000
Organization 6	Integrated Energy Company (IEC)	Energy	US$ 150 billion	80 500

Table 2. Summary of process management in the cases analyzed

Cases	Process Management
CDONPP	- A particular department is responsible for organizational design activities for the whole corporation. - Uses Process Maps as support to improve management. - Maps each part of the organization (Operating Units) and the relationships among them. - Links processes to performance indicators. - The specific department monitors the performance of each unit and develops strategic planning along with it.
ARTDC	- Unit linked to Top Management, responsible for the organizational structure has vision favoring processes. Has method of analysis and process improvement. Has studies to conduct organizational division redesign based on processes - There is a history of process usage in-house, but, nowadays, process initiatives are conducted in a decentralized manner. - Future implementation of "Process Office" in the Unit that gives support to Top Management. Advisory role. - The Unit that takes care of the organizational structure also takes care of the strategic planning and management improvement.
DEC	- The company's operation formalization and orientation are obtained based on processes. They are all formalized, documented and made available. - Company employees use these processes as reference for implementation of their work. - The context is of a complex, dynamic, matrix organizational structure.
BSMC	- The Management Model of the company is unfolded into formalized, standardized and registered processes. - The company measures the performance of areas and people through the way they perform the processes by which they are responsible. - Process mapping as a tool for middle management. Non-standardized modeling – models developed in a decentralized manner, according the needs of the local manager.
PS	- The Business Planning Department is responsible for the project management methodology. - Decentralized bottom-up movement, towards processes. Currently, the Planning Department has the mission of parameterizing and homogenizing the process approach within the organization. - Is studying method for process mapping. In the future, will relate processes and personnel dimensioning.
IEC	- Seeking to establish and consolidate process governance activity. Processes being considered the base for a coordinated improvement of the performance of the entire company. - Process governance instance designing the structure of process responsibility. This will come together with control and assessment mechanisms of employee participation in the processes and the results obtained. - Goals of process management established from the company's strategic goals.

	Goals & Measures	Design & Implementation	Management
Organizational Level	Organizational Goals and Measures of Organizational Success	Organizational Design and Implementation	Organizational Management
Process Level	Process Goals and Measures of Process Success	Process Design and Implementation	Process Management
Activity or Performance Level	Activity Goals and Measures of Activity Success	Activity Design and Implementation	Activity Management

Figure 1. Analysis levels

Source: Rummler & Brache (1995)
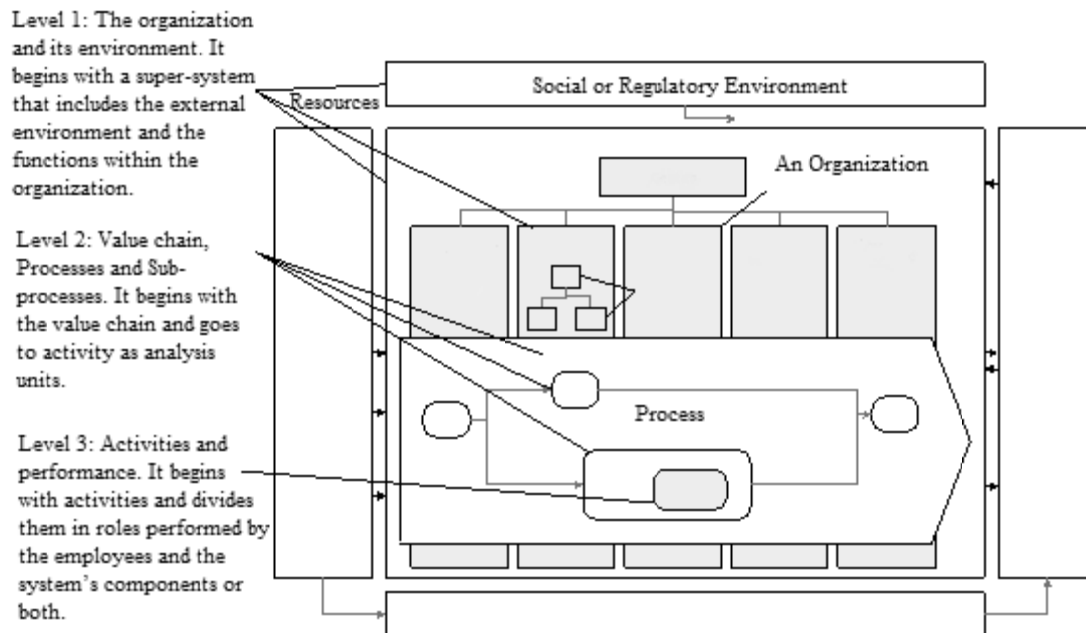
Figure 2. The organization, its processes and activities

Source: Harmon (2003: 131)
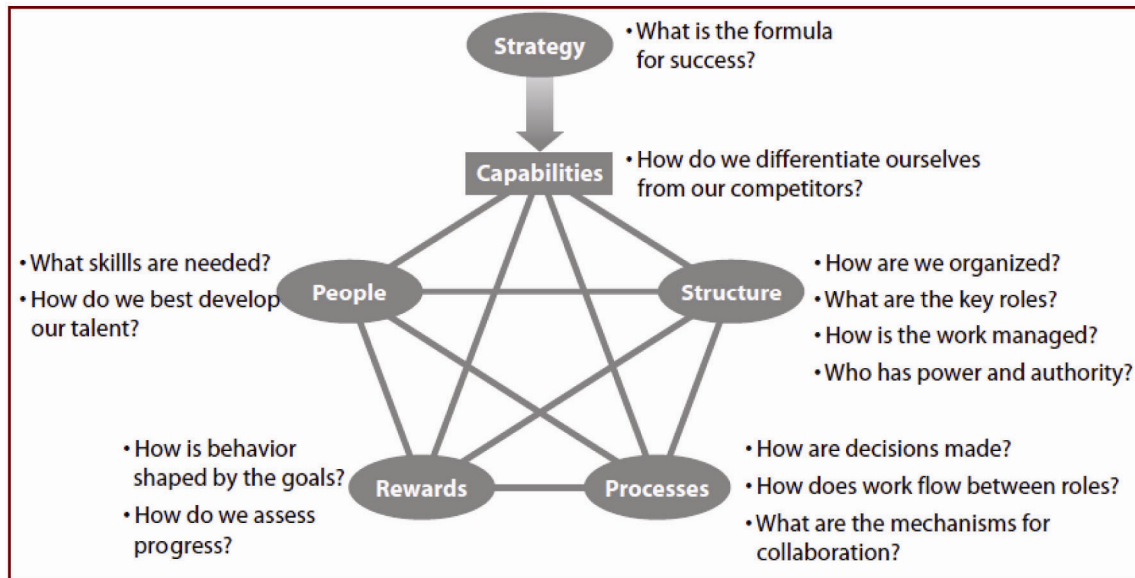
Figure 3. Star Model
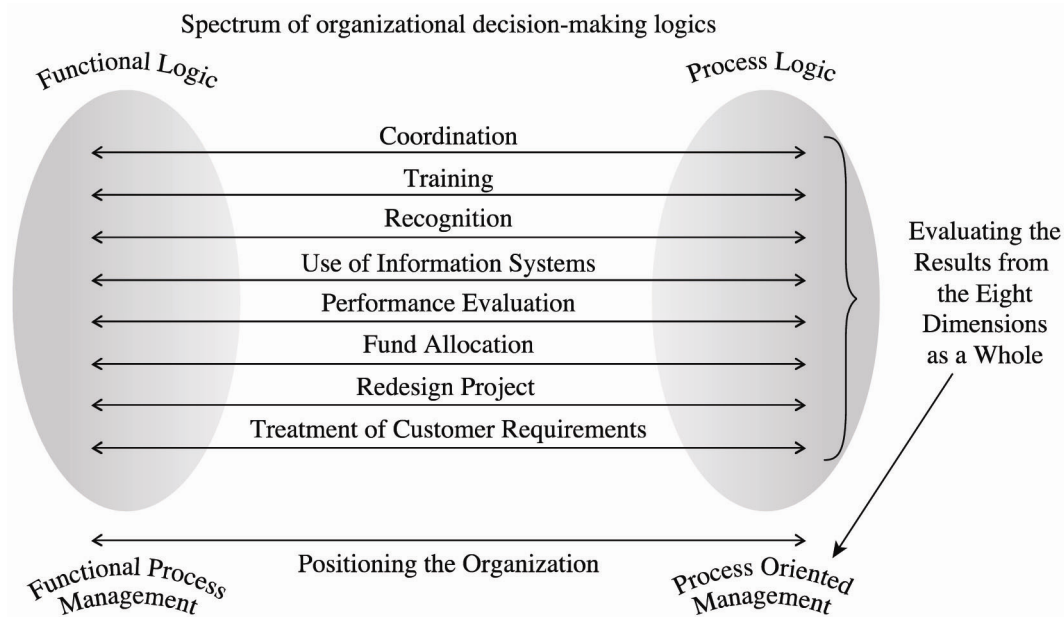
Source: Galbraith *et al.* (2003)

Figure 4. Functional process management vs process oriented management.

Source: Paim, Caulliraux & Cardoso (2008: 709)
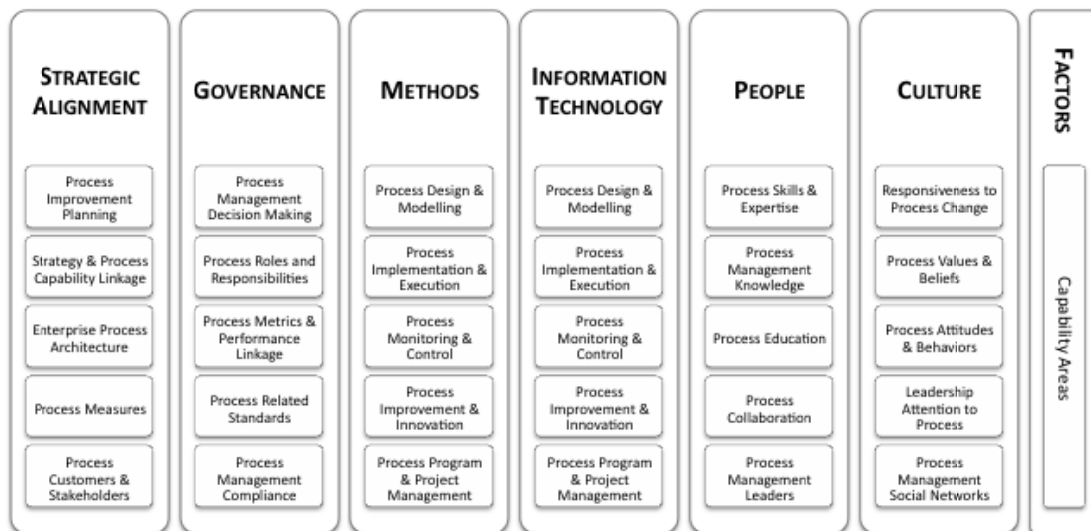
Figure 5. The six core elements of BPM

Source: Vom Brocke & Rosemann (2010)
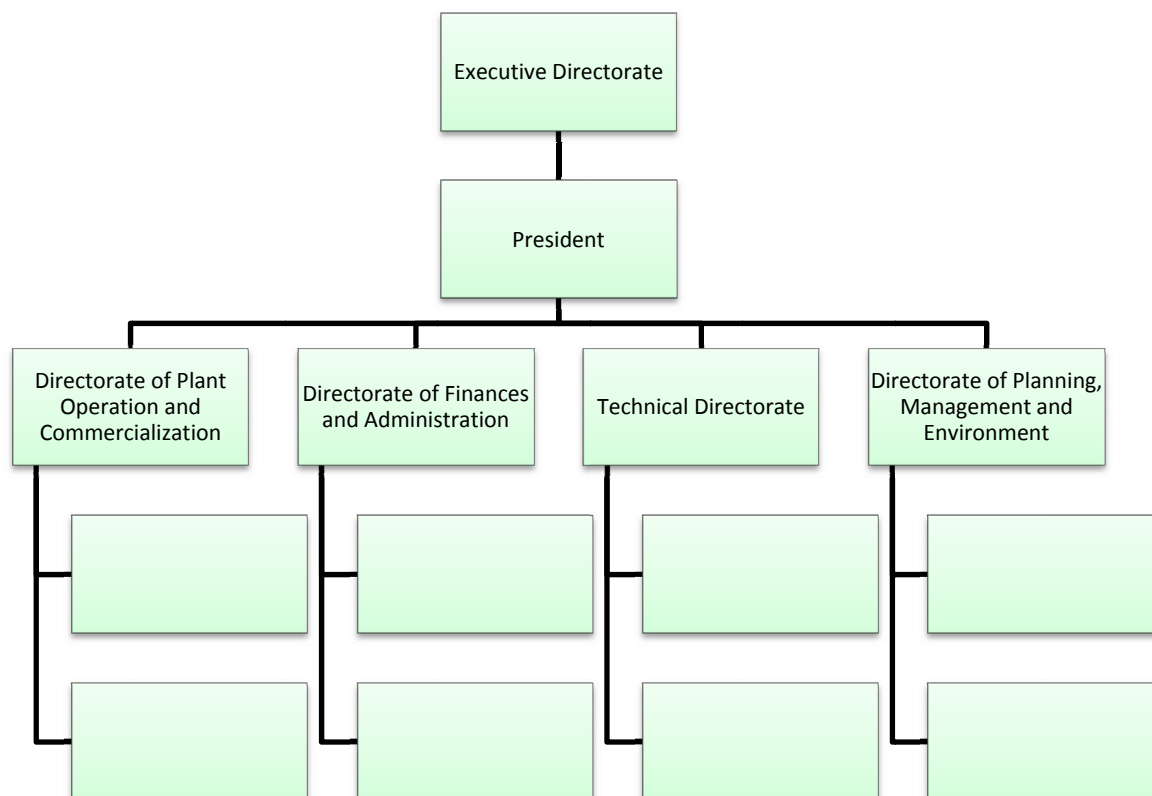
Figure 6. CDONPP's Organizational Solution
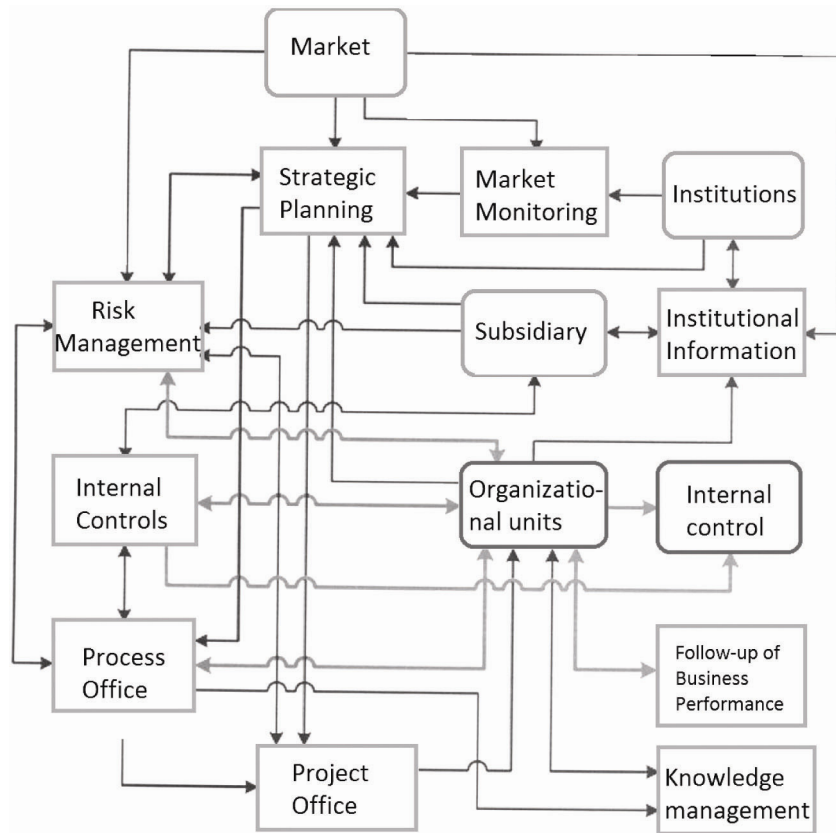
Figure 7. CDONPP's method
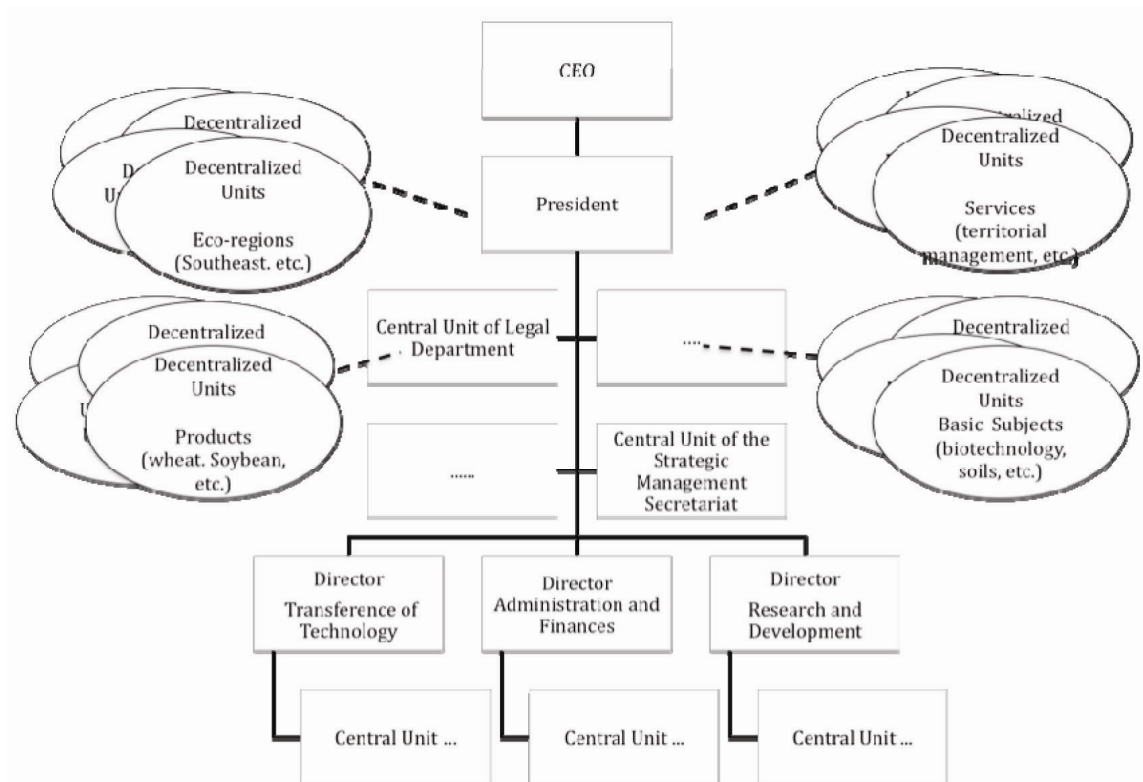
Figure 8. ARTDC's Organizational Solution
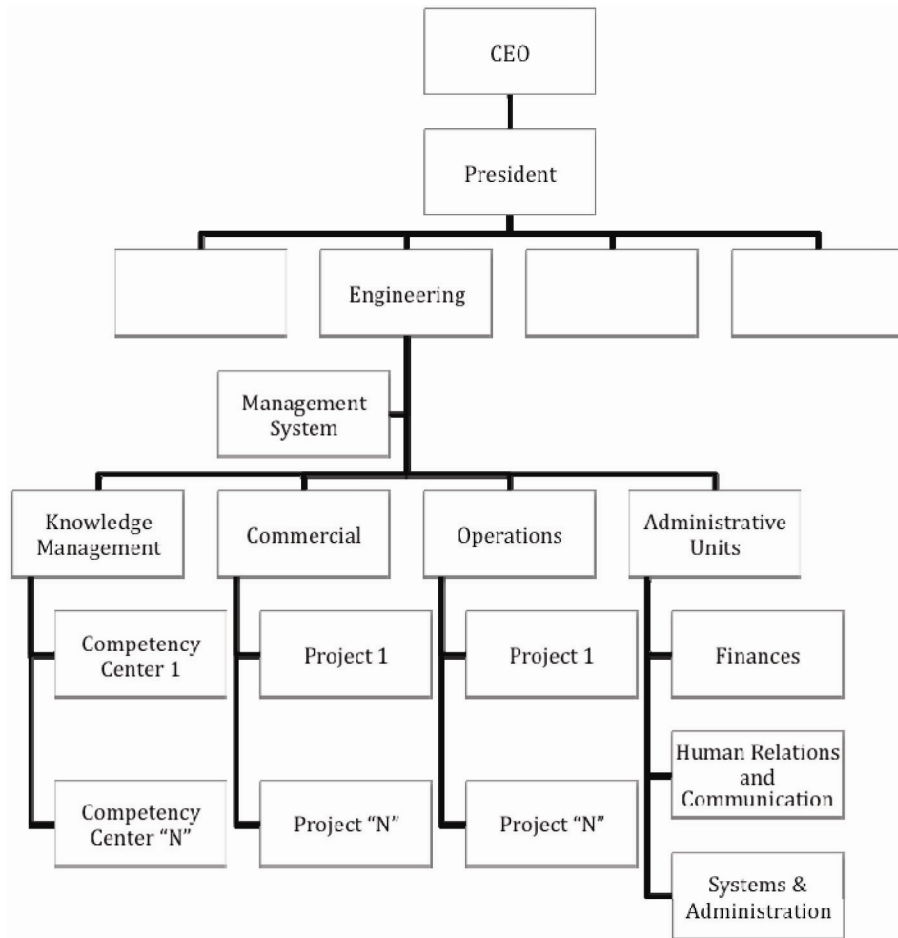
Figure 9. DEC's Organizational Solution
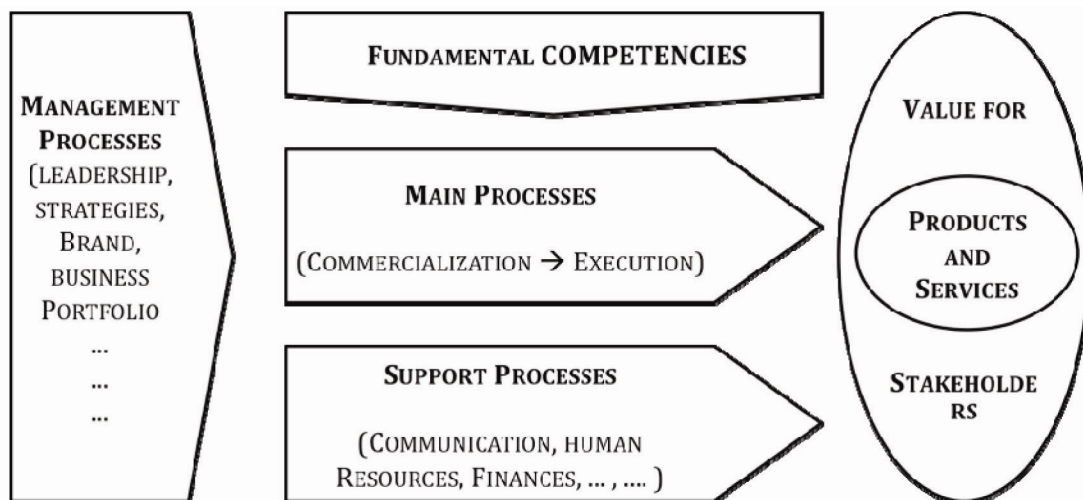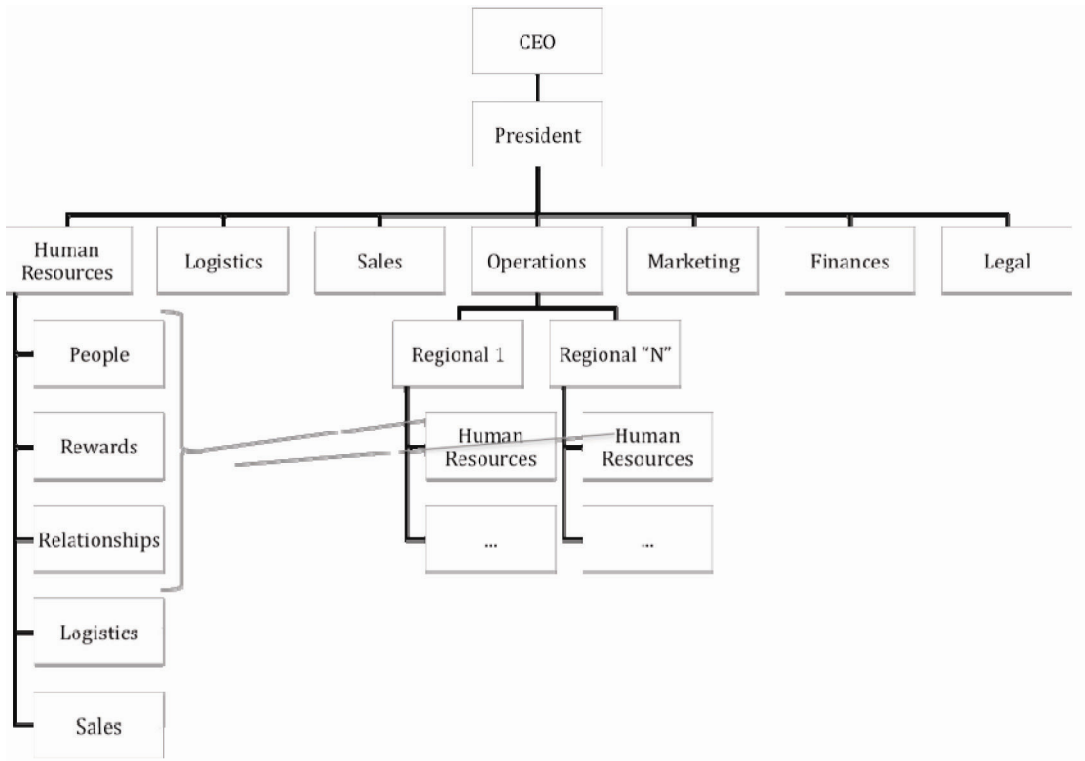

Figure 10. Reference to DEC processes

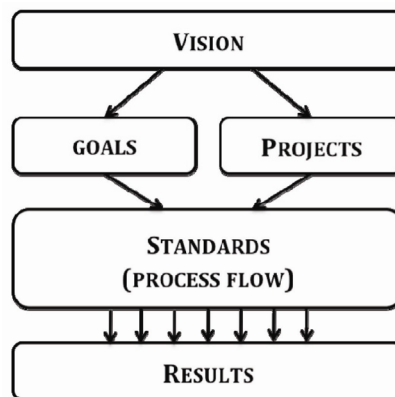Figure 11. BSMC's Organizational Solution
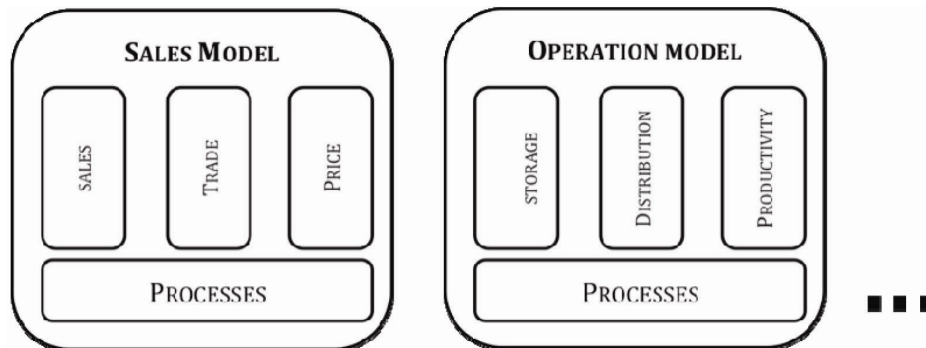
Figure 12. BSMC's Management Models

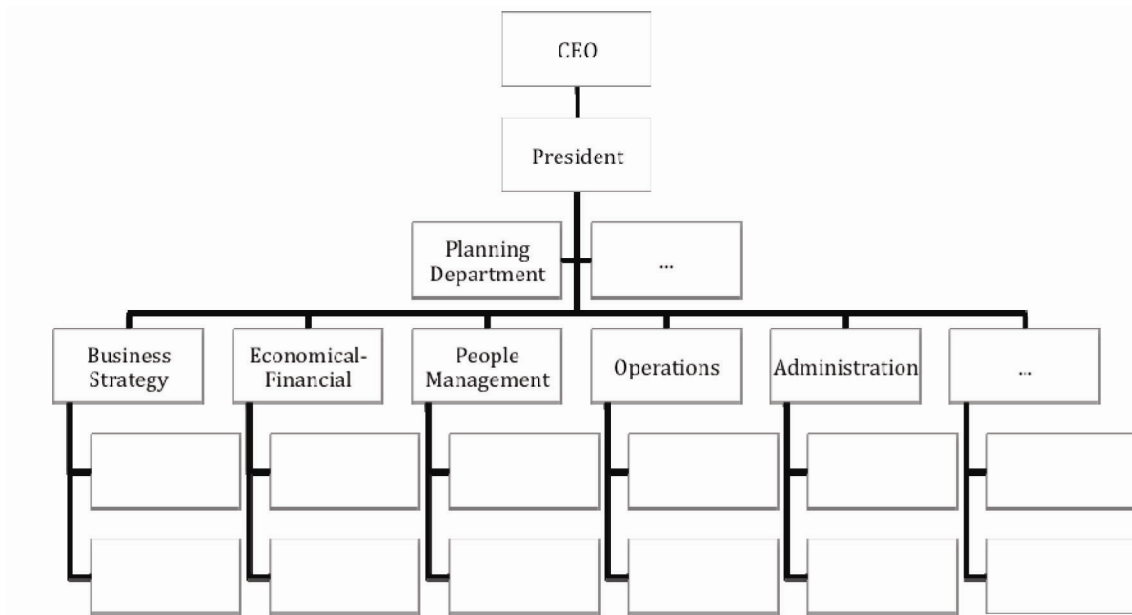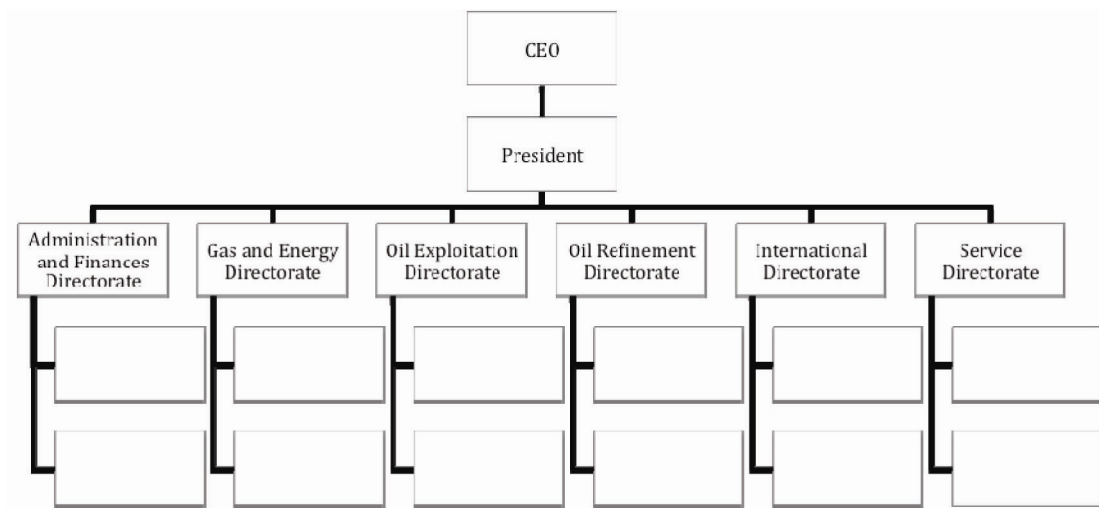Figure 13. Unfolding the BSMC's Management System

Figure 14. PS's Organizational Solution

Figure 15. IEC's Organizational Solution.