How to Implement Management by Systems Based on a New Systems Theory

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Abstract

Since the system concept was proposed, there has been a constant interest in applying it to the study of organizational management. There have been several attempts to study and understand Organizations as if they were systems and obtain from this interpretation approaches and methods to build business management theories. None of these previous attempts has managed to mark a significant change in the way companies are managed, they have contributed some analysis approaches with certain benefits on the interpretation of management, but none has been adopted as a new paradigm. Interesting topics have resulted but have not generated transcendental changes. This has been the case, because the theoretical framework of the General Systems Theory is too simplistic and not very strict and allows making unscientific assumptions and interpretations that led to dissertations with little practical criteria, although with clear logical grounds. In order to propose a truly systemic and practical management model, this paper proposes a theoretical framework for Organizational management, based on a slightly stricter and more practical systems theory: The Specific Systems Theory, based on its fundamental postulates, it was possible to accurately describe the systems that make an Organization work, how they interrelate and how they should be managed in order to achieve the ultimate goal of an Organization, to obtain the results that form its raison d'être.

Introduction

From the last century to the present day, management scientists have maintained a constant interest in studying organizations with a systemic approach, which implies that they have tried to define the organization or the company as a system or as an entity integrated by systems. Some of the best known contributions of the systemic approach to the organization are: Katz D. & Kahn R. (1967); Trist E. (1981).

A greater number of researchers have studied organizations as integrated by processes and have proposed a wide variety of models through which organizations can be analyzed and management methodologies and approaches determined that fully exploit the advantages of managing processes instead of isolated activities. The Japanese, for example, have based their Total Quality management on the concept of process, removing it from the production line and taking it to all areas of the organization. Ishikawa, K. (1988), proposed: "the next process is your client."

There are many publications on the study and management of organizations interpreting them as integrated by processes and there are also many research papers that have empirically

measured the role that processes play in their behavior. Some of the most significant are: (Ostroff F., 1999), Rummler G. & Brache A. (2013) & McCormack K. & Johnson W. (2001).

All the papers that have been published regarding the systemic nature of organizations or their process-based interpretation have provided some ideas and concepts that have contributed to improving managerial, operational, and administrative management. However, these approaches have suffered from two main flaws: They have taken the definition of systems proposed by Bertalannfy L. (1968) as the basis of their analysis and inquiry, and have used in their studies only the methodological advantage obtained by considering that to study a system one must take into account the interaction of all its components

From the foregoing, it can be concluded that the studies carried out, the techniques, models and methodologies aimed at applying the concepts of systems or processes in the management of organizations, have been developed with weak and not very rigorous theoretical bases, which surely has generated inconsistencies and errors in the management methodologies that have been proposed. For example, in the case of Katz and Khan, they considered large conglomerates of people and activities as systems, since Bertalannfy's definition allows any entity to be called a system, no matter how large or complex it may be.

They handled, for example, that the entire organization is a great system and that it is made up of five large types of subsystems: technical subsystems, support subsystems, maintenance subsystems, adaptive subsystems, and management subsystems. Each of them are huge complexes of people, machines and actions, impossible to manage and for which no one can be responsible, with an approach like this it is impossible to establish a management model or method.

In the case of processes, all the approaches that have been generated lack a clear and precise concept of what a process is and for this reason, when they have been applied, those responsible for identifying the processes do so based on very imaginative interpretations, but of little practical value and are often also seen as processes, large conglomerations of roles and responsibilities for which no one is responsible and which are impossible to manage. They use apparently logical and clear diagrams to describe the organization based on processes, but in the end they are useless as management tools.

The only way to avoid wandering and free-thinking a system or process and getting interpretations based on imagination, inspiration and subjectivity, is to establish a strict theoretical framework that sets the limits of what is acceptable, practical and applicable. In our case, this theoretical framework is obtained from the Specific Theory of Systems developed and published by the author of this work: Pérez G. (2023).

According to this theory, a system is an entity composed of the following essential elements; (1) Components, systems are made up of a set of components that perform consistent and predetermined actions; (2) Structure, the systems have a structure constituted by interconnections between the components that allow the exchange of matter, energy or information; (3) Organization, systems have an organization that establishes the actions to be performed by each component; (4) Process, the systems work based on a process that establishes the way to combine the actions of the components in order to obtain the expected final result of the system, which can be actions or material objects.

The processes can receive inputs that are transformed into material products by the system and if they do not receive them, then the results of the system are actions; (5) Products, they are the results obtained from the process, which can be actions or materials; (6) Energy, the systems

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use energy to generate the actions carried out by the components, which can be received from the external environment or generated by the system based on materials obtained, also, from the external environment.

This definition reveals a startling discovery: All systems have at least one process, and every process belongs to or functions as part of at least one system. In simple systems, each system has a process, and every process belongs to or works on the basis of a system. In complex systems, the relationship between processes and systems is not unique, a process can work as part of several systems and a system can have several processes, some of them shared with other systems. From now on we will no longer make the clarification that whenever we refer to a process we are referring to a system of which it is a part. Therefore, when talking about process management we will be talking about systems management.

Results and Discussion

Every organization exists to obtain certain pre-established results and every result is generated by a process and obviously by a system. The results of an organization are its products and the products of an organization can be goods or services. The goods produced by an organization are objects, the services are actions that are generated to satisfy a need or requirement of a person or social group. Every material product is generated by a network of systems that supply goods or services to the process or system that generates the organization's product and which we call the central process or system.

This network of systems can be represented, based on the processes, by means of a diagram like the one in figure 1. It should be remembered that each process has an associated system that is not drawn, therefore, figure 1 is a diagram of systems simplified. We will call the diagram in Figure 1 the Systemic Map of the material product. Each material product has its own Systemic Map. We call the process that generates the product the Central Process or System, we will call the solid black processes or systems Key Processes and we will call Support Processes or support systems the white fill processes.
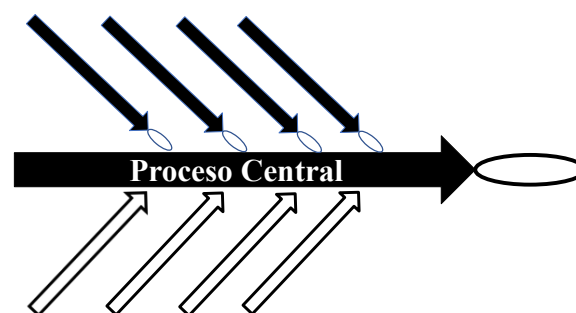

Figure 1. Systemic Map. Systems Network

The key processes are of capital importance because they provide inputs to the central process, so that they are modified or integrated into the product and therefore have a direct influence on the quality of the product, any quality failure in an input generates a quality failure in the product. White fill processes provide services required by the system network, which do not have a direct influence on product quality. The ovals represent material goods such as: the final product of the organization and the inputs received by the central process.

A central process cannot receive any service as an input, since we must remember that services are actions and if an action is applied to the final product, then that action is part of the central process. Inputs are always goods, tangible objects, matter and not actions. The support

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processes do not have ovals at the end of the arrows, because as they are services they do not supply any material object, or else, to the central process. These services do not perform actions on the product and therefore do not affect the quality of the product and should not be incorporated into the central process. Support processes are services that require the core process and key processes in order to function. Typically these are energy services, cleaning services, lighting services, financial services, human resources, and many more.

It is natural that the intention arises to say that the systems that make up the Systemic Map make up, in turn, a system, whose components are systems or subsystems, as many would try to call them, but it is not correct to say something like that. According to the definition of system that is adopted in this work, the components of a system generate actions and the key processes, generate material goods. For this reason, it is said that the systems that make up a Systemic Map make up a Network of Systems (SN), not a system. Other products of the organization are services that are provided to customers, sometimes directly associated with material products and other times as independent products.

There are organizations that only offer services as products, others offer goods, services linked to the goods or services independent of the goods, which constitute products by themselves. Some services are products that may be included in the price charged for goods and others are marketed separately. In any of these cases, the services are constituted exclusively by actions carried out by the organization, although frequently the services imply carrying out actions on material objects, but the actions do not transform the object, they only manipulate it. For example, in a transport service, the carrier receives an object and performs various actions to take it to some destination. Those objects that the service system receives are not inputs because the central process does not modify or transform them. The services have a systemic map like the one shown in the following figure:
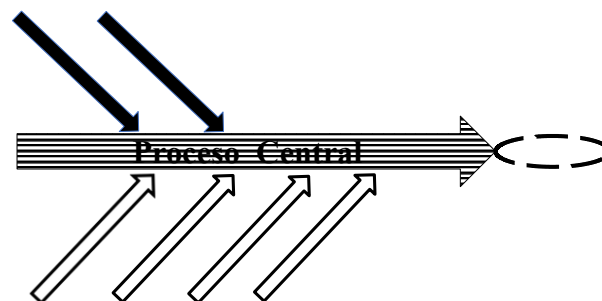

Figure 2. Systemic Map or Systems Network of a Service

Processes that have a solid black fill represent material object inputs to the Central Process, but do not have ovals because those inputs are not raw materials. So the organization, in general, will always be a company, but everything that is said here is applicable to any type of organization. An organization can be represented with a graph like the one shown in Figure 3. The arrows represent the systemic maps or SN's of the organization's products that leave it and are delivered to customers who demand them.
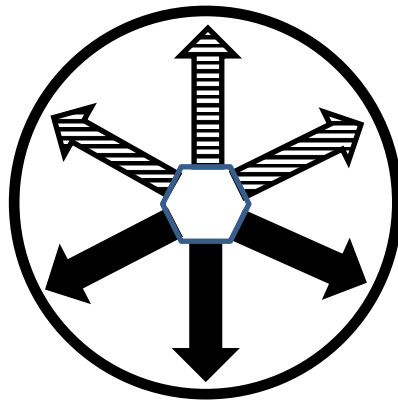
Figure 3. The Organization and its Final Products

Those in black correspond to System Networks that produce material goods and those that are hatched represent services. In this case, only six products or maps have been used to represent an organization, but in reality they may be more or they may be less or it could be an Organization that does not produce goods and all the maps would be hatched.

Fundamental Principle of Management

The organization's fundamental purpose is to produce the final products that go to its customers, this is what allows the Organization to survive. Without final products or with incorrect, defective, impropriety or extemporaneous final products, the organization will fail quickly. For this reason, the fundamental principle of Management is stated as follows: It is essential that someone is in charge of ensuring that all the systems of the Systems Network (SN), of each one of the products, work correctly and the Key Processes and Support processes provide the goods or services required by the Central Process.

The Organization has to work in all its areas with a clear conviction that all its members contribute in some way, often not directly or obviously, for the correct functioning of the Systemic Maps of the final products and that, if the SN's fail, the entire Organization will go to failure. There are, of course, many ways to design an organization that ensures that someone is in charge of running each of the various end-product System Networks. But the first requirement to meet must be the precise and detailed identification of the systemic maps and their confrontation with reality to ensure that they are precise and exact. Without the systemic Maps that describe the SN, it is not possible to think of designing the organization that ensures its perfect functioning.

Modern organizational designs are very flexible and adjust to many different situations, with communication networks in all directions and with the help of modern technology, agile and effective organizational structures can be designed to effectively manage SN's. The main problem faced when managing a product SN is that most of the systems that participate in it are under the command of different organizational units, which, if they are not aware of the role they play in the SN, may be operating with incongruous objectives emanating from their own vertical focuses or interests.

These inconsistencies are more frequent than we can imagine and are the cause of some companies or Organizations being perceived as more complex and chaotic than they really are and that this causes a large number of problems that are difficult to identify and in case of succeed in identifying them, it is difficult to determine the causes and, therefore, the solutions.

In order to apply the Fundamental Principle of Management, a simple model can be adopted that consists of creating product managers organized so that their different areas are in charge of one or more SN processes. The grouping of processes to make up these areas must be carried out on the basis that they share some related concepts. But the most important thing is that these managements must have full authority over the SN processes, so that the organizational units responsible for operating them have to strictly comply with the requirements of the product managements.

The latter leads us to postulate a corollary of the Fundamental Principle of Management: The organizational units that are responsible for operating processes that participate in SN's of any final product of the Organization, have the obligation to abide by the instructions that the product managers communicate to them in relation to the operation of said processes in an SN. The SNs function, then, as clients of the organizational units that operate the processes that are part of them. The organization must function in such a way that the product managements set the tone in the operation of the SN and the organizational units involved with them must follow these guidelines, since the fundamental thing is that the Organization's products are perfect and timely.

This is the scheme that is followed in Kaizen when working on demand to avoid bottlenecks and also supports the concept of Just in time. The important thing to highlight is that the concepts that have been developed in this work reveal the theoretical support of several of the disciplines that are integrated under the Kaizen methodology. The Japanese use Kaizen methodologies in a practical way, but they adopted them as a result of empirical observations and inductive developments based on common sense, which were undoubtedly correct since they have returned tangible benefits. Now, however, all this can be supported theoretically and thus, other paths can be opened to develop new methodologies or refine existing ones.

The inputs of a central process can be generated by SN's that belong to an organizational unit of the Organization or can come from a supplier from which they are purchased. Many companies follow the practice of concentrating the acquisitions of inputs for the production of their products, in organizational units specialized in this activity. These are services that are in charge of receiving the input requirements for the processes and search for the best prices, obtain the inputs, receive and verify them and finally deliver them to those responsible for the production SN`s. In these cases, the acquisition processes appear as key processes of the corresponding SN's.

The companies that adopt the concentration of acquisitions do so thinking that the volumes handled will allow them to obtain economies of scale and thereby reduce their costs and increase their profits or avoid corruption. The problem is that none of this translates into real benefits for the company, the concentration of acquisitions generates many points of ineffectiveness and inefficiency and generates delays, poor quality of inputs and, therefore, of products, which in the end are transformed into higher costs than those obtained in economies of scale. These concentrated procurement schemes never work.

Therefore, from the previous analysis the second corollary of the Fundamental Principle of Management is derived: When a Central Process requires an input that is acquired from an external provider, the acquisition process must be in charge of the corresponding product management. The management staff knows precisely what is required, can carry out the procedures in a timely manner and verify the quality of the inputs with certainty.

If the previous corollary is adopted, then it will be possible to obtain savings, but through mechanisms other than economies of scale. In this case, the savings come from long-term, equitable dealings, mutually beneficial relationships with suppliers, and making honest, win-win deals, as practiced by Japanese companies.

Systems Management

In the previous title, the basic principles that must be adopted to develop management strategies that allow the processes directly involved in the generation of the final products of an Organization to function correctly were established. Only then will it be possible to produce these products with all their quality characteristics and in a timely manner. However, it must be remembered that from the beginning it was established that the processes are only a part of a system and that every process works based on the actions generated by the system components, but the most important thing is, and should never be lost sight of, that a system works integrally or does not work, which means that for a system to be a system, all its parts must be present and each one of them must exercise the part that corresponds to it, it is enough that one of said parts stops participating correctly so that the system lacks all effect.

The systems work holistically, as a seamless whole. It is not enough to consider in the study of any situation the components and their actions or interactions as mentioned by Bertalanffy (1968). The first thing that must be considered is that the systems that are part of an Organization, which we will now call Organizational System OS to distinguish them from other existing systems in the world in which we live, are of a very special type, they are social systems, which means that Its components are people and people act according to their will, a circumstance that adds a significant degree of difficulty for the correct management of these systems. In addition, people have intelligence which allows them to design organizations and processes, modify the structure and make vary all of the above, according to their convictions, knowledge or interests.

In order to understand precisely what an OS is, it is necessary to describe each of its parts: (1) Components, the components of an OS are the people who make it up. Many times, instead of people, machines are usedhat carry out actions that one or more people would carry out, and for this reason some authors call OS socio-technical systems. It is the people who carry out the actions that give life to the system or the machines, if applicable; (2) Structure, the interconnections between the people or components of the system are established through the human senses, mainly sight and hearing, so for the structure to work, people must be able to perceive the sources of information through their senses and for this machines are used that are part of the structure and make communication possible.

In order to move the will towards carrying out specific actions, people need information and the structure satisfies this requirement. Another part of the structure of a social system can be integrated by other machines that allow the exchange of materials between the components in order to achieve the predetermined result of the system; (1) Process, as a prerequisite to the organization, it is necessary to design the process that is required to obtain the result or product that the system must generate. When designing the process, the inputs that will be required, if any, must be determined. Obviously the process is composed of human actions or of machines controlled by people; (2) Products, this is the first step that must be taken when you want to design a system.

The perfectly designed product is the basis for designing the process that will be required to generate it. The process establishes the actions and their conjugation and the organization

establishes which component will carry them out; (3) Energy, the energy of human beings comes from their diet and it will also be necessary to determine the energy that the components that are machines will require and that required by the machines that complement the structure. If you already have a perfectly integrated system, management consists of making it work correctly and there are no major secrets, but it can have great difficulties. All the elements of the system have the same importance, since it is enough that any one of the parts does not work or works badly, for the system to lose the capacity to generate the product strictly attached to its design.

It is impossible in the space of a document like this, to describe in detail how systems management should be done, so I will address only those issues that I consider crucial. It is essential that all the social needs of people are covered and all the environmental and human aspects that are required to eliminate any cause that could create dissatisfaction and obviously correctly manage all relationships between the company and the workers, at all levels and in all aspects. Covered the above, it must be ensured that the organization is known and dominated by all people, training in carrying out the required actions is essential and it is also important that they know the entire process to place their participation in the context and be able to anticipate the implications and consequences of their actions.

In Kaizen this approach is managed, mainly through the work in quality circles. This comment might seem out of place, but I include it, along with others like it, as a way of illustrating that empirical concepts of Japanese management have theoretical support. One of the parts that ensures the holistic behavior of the system, that is, the synchronous and consistent operation of the actions of the components, is the structure. In the case of social systems, the structure is built based on the communication that allows the flow of information. information. It is important to note that in this work we interpret communication as the means through which it is possible to transmit the information that allows coordinating the functioning of people.

The structure of the social system is built based mainly on communication between people, as part of the management it is necessary to establish this structure and take care that it works effectively and above all design it so that it contributes to the functioning of the system. Again, in Kaizen this requirement is adequately considered, through the Kanban devices that allow the coordination of manufacturing processes and their associated processes. Another part of the system structure that usually exists are the means required for the flow of materials when the process requires it. Obviously the process is the part of the system where the ultimate goal that justifies and defines it is generated, for this reason it is essential to take care that it develops continuously, always in progress and without interruptions.

If all of the above has been achieved correctly, it is almost certain that the process will not have obstacles in its operation, however, both the people and the machines that participate in the socio-technical systems usually have alterations in their activity and all of them must be identified and corrected promptly and quickly. Mechanical systems have predictable behaviors with certainty, their problems are easily detected and the solutions, which are technological, can always be found and obtained. On the other hand, the problems of a social system are never clear or unique, they are never well defined and are confused by ambiguity, the solutions are difficult to find, they are not unique because several are always required at the same time, they are expensive and achieve results slowly.

In addition, social systems present a wide range of possibilities in terms of the way to define their organization, the rigidity in their application and the variability of their structure and their processes and, therefore, all this is reflected in the variability and inconsistency in the results.

To obtain more information regarding social systems and their wide variants, the work published by the author can be consulted: Pérez G. (2023). In an Organization, a wide range of variants of human social systems will also be presented, there will be very rigid systems in which the organization, structures and processes always work according to what is established and this is an important part of the management and, in a wide range of possibilities, there will be systems that have more or less slack in the variation of their component parts. The slack in social systems is based on the capacity that gives human beings their intelligence.

Every organization, every design of structures and processes, requires intelligence that understands the purposes and expected results and converts them into systems by designing the required parts. Therefore, due to human intelligence, there will always be a tendency in people to design or modify the parts of the system in which they participate and management must take care that this does not happen or that it happens to the extent that circumstances require it. For example, in lines where pre-engineered material goods are assembled, the clearance has to be minimal so that said goods are consistent and maintain the established quality. But in service processes, especially in customer services, where conditions can change depending on the characteristics of the customers, it will be necessary to anticipate that the components of the system, the people, can modify the organization, the structure or the processes or all this, through the use of their intelligence, in order to achieve the appropriate and convenient result for the Organization.

The important thing is that the slack or flexibility in the systems must emanate from a management strategy and not arise from the disordered interest of the people involved in the social system. What is fundamental is to determine the degree of narrowness or rigidity that the system requires to have in order to adequately adapt to the type of task to be carried out and, above all, to the result that is desired to be obtained. In the cases of maximum slack and flexibility, the only thing that is defined is the result and it usually turns out to be easy to define and describe, they are events that occur or do not occur, partial results are not allowed. In these cases, the circumstances and context in which the system operates are highly variable and difficult to predict.

People have to observe what happens, what others can do, if they participate in groups, and quickly define their individual actions. This is designing the organization, at least individually. The more effective the communication structure, the better these systems can function and with more integrated, coherent and widespread organizations. It should also be considered that to the extent that the systems have more slack and flexibility, it is more important to establish certain rules that limit the scope and direction of the actions that people can carry out and it will be crucial that the values, vision, mission and the objectives of the Organization to which they belong and the needs of the clients for whom the system works, are well integrated into their conscience.

The Systemic Organization Chart

Traditionally, a graph called an organization chart has been used, in which the division of work by major functions or disciplines is described and the authority of the managerial figure over those responsible for each of these functions is established with lines. The division of work of the primary functions is also drawn in more specific areas of activity or subfunctions and the hierarchical authority is established, also through the use of lines that indicate subordination or dependency and in this way the work continues to be divided down into levels lower in the hierarchy to the extent necessary to describe some desired organizational situation or management context.

One of the main problems of the classic organization chart is that it only describes with some precision the application of authority, its hierarchical stratification and the names of the command posts of each function or subfunction. To complete the organization chart and help in the exercise of management, an organization manual is prepared that describes the functions, which are nothing more than the description of what each function or subfunction has to do at each of the hierarchical levels. The important thing is that the manual describes what has to be done, but does not mention what has to be achieved. The systemic organization chart (SOC) describes the organization based on its systems and, therefore, describes the results or products that each system has to generate.

Therefore, the SOC specifies what has to be achieved, in addition to indicating who is responsible of the results that are generated and this is described from a first level of observation where the Organization is considered as a whole that subsists based on the SN's that generate the final products demanded by customers and in successive levels of detail describes the SN's that supply inputs or services for these. Figure 3 describes the first level of deployment and it shows the SN's that generate the final products of the organization. The outer circle represents the authority and responsibility of the Director General, he is responsible for the Organization as a whole and for its final products. Any failure, defect, inconsistency or delay that the final products of the organization present are the responsibility of the General Director.

The SN's that generate the final products that we will call SN1 are made up of many processes or systems that are central processes of SN's that belong to other Organizations. This second level of display shows the diagrams of all the Organizations that contribute with their final products to the operation of the SN1 or generators of the final products of the company or organization. So, an Organization is integrated by other Organizations that represent the same concept, each one of the Organizations of the second level are represented by a diagram similar to that of figure 3. Figure 4 shows the representation of the second level of deployment, in the the center is located the specific organization, product management, which is in charge of generating the final products, that is, the management of some SN1. In this case, only one has been drawn, but there may be several, according to the variety and quantity of final products.
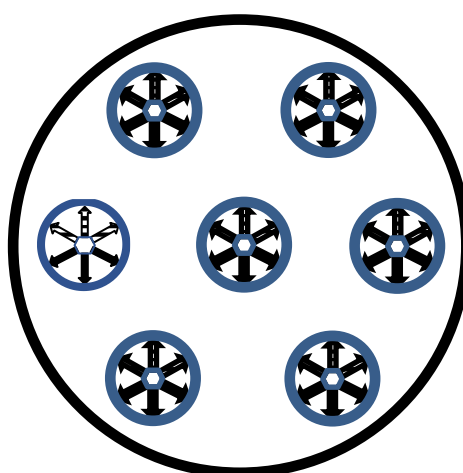

Figure 4. Second Level Deployment Organization Chart

Each one of the diagrams around the center, represent the organizations that manage the key and support processes that are part of the SN1 that in turn generate the final products of the

company. All second level Organizations have to manage some key or support process of the SN1, or they would not have to exist. They could handle some other processes that participate in SN's of other Organizations that are not the ones that produce final products, but this always has the risk that they may not be essential for the company. The outer circle continues to represent the area of responsibility of the General Director: in addition to being responsible for the final products of the Organization, he is responsible for the joint, coordinated and consistent work of all the organizations that participate in the generation of final products.

Each of the second level organizations must be analyzed and interpreted as was done with the company, all organizations are studied and organized in the same way. Each Level 2 Organization has its own final products and, therefore, its own SN's that generate those products, which we have called SN2, represented by the arrows emanating from the center of the smaller circles. Logically, each of these Organizations can have third-level Organizations that manage the SN3 that have the processes of the Level 2 Organization as central processes. This analysis is identical to the one that was made when going from level one to level 2. Figure 5 shows a diagram that describes this situation:
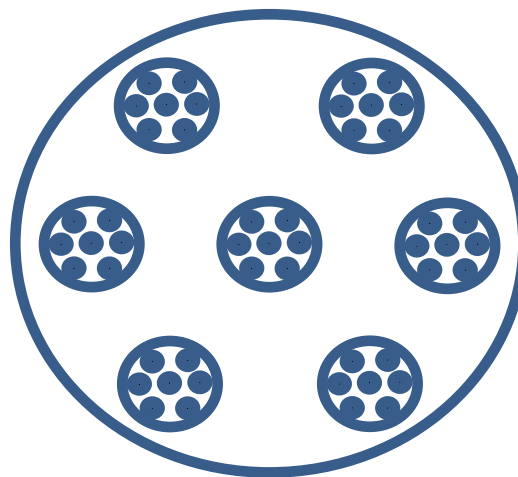

Figure 5. Level 3 Systemic Organization Chart.

You can continue developing the deployment levels to the detail you want. There is no theoretical limitation for this, as many levels of deployment must be developed as necessary to clearly describe the systems so that they can be assigned to an organizational unit and have a specific person responsible for their management. In addition, the deployment must preserve social systems with numbers of people that can be managed by one person in charge. An excessive number of deployment levels increases the costs of the organization and complicates the operation. Another relevant circumstance is that given the clear concatenation of the processes from SN1 to any SN of any level, all people can easily follow the route from the particular system in which they work, to the SN1 of the final product with which they are contributing.

The important thing about this approach is that the organization, that is, the integration of management units, is defined based on systems and not based on functions, professional disciplines or technical specialties. Those responsible for certain positions in the organization do not manage resources or people, they manage systems and with this, it is clearly defined what they must manage: people, structure, processes, energy, inputs and organization and above all it is perfectly clear for whom they must generate their products and the obligation to

contribute, always, for the proper functioning of the SN's in which the systems under their responsibility participate. All prejudices of authority and hierarchy are put aside and the organization is built based on the success of the systems and with the inescapable need to contribute, to act in a manner consistent with the results that are required.

In the organization by systems, authority relations or power relations are not established, although they necessarily exist and are an important part of any organization. What is established are the areas of authority over which executives have the responsibility to ensure that all the organizations under their charge function in a consistent and synchronous manner, they must focus on the perfect functioning of SN's, doing what is necessary backwards, towards forward or in any direction as long as the results are always obtained.

Executives or managers are responsible for complete SOC's with all their systems and all their products, this forces them to maintain a comprehensive approach and cannot limit themselves to coordinating or directing their direct reports as emphasized by the traditional organization chart of positions or the manual of administration that states what must be done and omits what must be achieved. It is one thing to be responsible for subordinates and quite another to be responsible for the final products of the organization.

Conclusion

The traditional definition of system is so general that it does not allow us to draw useful conclusions. In this work, a more specific system definition was used that allows finding clear concepts that can be found in all systems and principles that can be logically and clearly transferred from one type of system to another. The definition is specific, the conclusions, reasoning and principles are easily generalizable. In this work, the Specific Systems Theory has been applied and it has been clarified how an organization integrated by systems looks like and what are the management principles that must be applied to take advantage of this holistic and at the same time integrating concept that directive management poses as action oriented to consistency and effectiveness.

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