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# Management of Non-Rationality through Decisional Knots in the Project's Society II

## Gestión de la No Racionalidad mediante Nudos Decisionales en la Sociedad de Proyectos II

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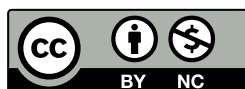
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### ABSTRACT

Project Methodology has been impacted by the intense digital transformation of the last decade, made possible not only by the evolution of microcomputers, intra-networks, networks and decentralized computing, but also by the maturity of digital corporate spaces based on robust digital platforms. This article relates the above phenomena, product of performative mechanisms with linguistic, social and political characteristics that are impacted by constant transformations and redefinitions adjusted to a Connective Non-Rationality that modifies ends and modifies means according to external pressures. The methodology of structuring and management of projects called Logical Framework, with the idea of applying it in organizations with quality assurance systems, focusing the analysis on the permanent changes of the environment and solving problems associated with decisional knots leading to standardized mechanisms that package Lego-like decisional routines.

### RESUMEN

La Metodología de Proyectos ha estado impactada con la intensa transformación digital de la última década, posibilitada no solo por la evolución de los microcomputadores, las intraredes, las redes y la computación descentralizada; sino por la madurez de espacios corporativos digitales basadas en robustas plataformas digitales. En el presente artículo se relacionan los anteriores fenómenos, producto de mecanismos performativos con características lingüísticas, sociales y políticas que son impactados por constantes transformaciones y redefiniciones ajustadas a una No Racionalidad Conectiva que modifica fines y modifica medios de acuerdo a las presiones externas, con la metodología de estructuración y gestión de proyectos denominada de Marco Lógico, en la idea de aplicarla en organizaciones con sistemas de garantía de calidad centrando el análisis en los cambios permanentes del entorno y resolver problemas asociados con nudos decisionales conducentes a mecanismos estandarizados que empaquetan rutinas decisionales tipo Lego.

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## 1. Introduction

The extensive use of Project Methodology began at the end of the last century and is prioritized in the 21st century, particularly linked to large digital transformation projects, largely made possible by the evolution of microcomputers, intra-networks, networks and decentralized computing (Intel, Apple, Microsoft, Sun, Oracle); and the generation of digital corporate spaces generated by Global Digital Platforms (Amazon, Google, Facebook, Twitter).

These processes accelerated and promoted industrial offshoring, displacing manufacturing to the periphery, as in China and other nations without strong labor regimes, and the concentration of creation, conception and design in the countries of the center, such as the United States, Germany and France.

However, the problems derived from purchasing power eroded by the decline of wage societies and the substitution of precariousness and labor flexibility, generated two phenomena: the need for consumer articulation beyond national borders, and the need to build permanent multidimensional profiles of consumer preferences -beyond goods and services associated with survival- and the generation of expectations of experiences that compensate for the deficits of sociability through a platform sociality that modifies desires and needs. The above has incorporated, in addition to the selections of modes of conducting social and political processes, in public policies and public managers a marketing issue.

In order to frame this phenomenon, it is necessary to contextualize the Schumpeterian source and the Non-Rationality in the Decisional Knots.

In the previous perspective, in the pre-industrial development models, knowledge was used to organize the mobilization of labor capacities and means of production; while in the industrial model, knowledge is used to provide new sources of energy and to reorganize production. Now, in informationism, knowledge is used to promote the generation of new knowledge as a source of productivity.

Under the given premise, Schumpeterism is a of social relation mode of organization and dematerialized economic activities, built from the impacts of new technologies that have reduced the need to work physically and expanded free time, as well as the

production of informational goods that have corroded the market's ability to set prices and generated strong monopolies. Consequently, relationships and activities have been transformed into pre-modern forms of collaborative production of Communities originating in Asia, Europe and America, [1], liquidating the wage society because it modified the main characteristic of work from being the standardized and main social function in the community bond.

The new Development Model, meanwhile, is based on the Informational Mode that Castells describes as a form of work organization in which the large-scale use of microprocessors in automated, robotized and computerized processes, and genetic modifications in living beings improve productivity and dematerialize economic relations, [2]. The mode of regulation in Schumpeterism is informationalism: a form of socio-technological-economic organization that makes extensive use of digital information and microelectronic communication technology focused primarily on the technological capacity of communities and individuals as a condition for the generation of wealth, the exercise of power and the creation of cultural codes.

On the other hand, the core of the informational economy is the processing of symbols, which is expressed as a global network of financial markets based on Information and Communication Technologies -ICT-; where productive organizations maximize their value chains by increasing informational intensity, [3]. This Informational Mode is characterized by two aspects: 1) Concentration on Information processing; and 2) Effects centered on the transformation of Processes. Applied to the Increase of material wealth by generation of surplus in the productive processes.

Alternatively, Informational Development for Castells is the equivalent of industrial development because value is generated by the transformation of information into knowledge and its application to all productive activities. It uses on a large scale Digital Information, the ICT; then it presents a synergic link between the informational and the human because it generates an organizational transformation by allowing both the Network-Organization and the networks of organizations as well as the global network society.

As a consequence, Digital Platforms have generated a New Digital Space different from the public and private ones. This New Corporate Space, based on a virtual architecture, conditions both human interactions and the

generation of contacts, affinities or communities from a mercantile perspective through mediations that replace intermediations, transforming the traditional informal social activities -proper of the private sphere where tastes and consumption experiences were shared- by a Mercantile Corporate Space generated by algorithmically oriented interactions: Sociality, Creativity and Knowledge are produced there, but above all, consumption and preference profiles. However, also the connectivity of the network society and the emergence of the New Digital Corporate Space generated have increased a new happiness for the new digital sociality of social networks and for the empowerment associated with the Internet of Things (IoT), [4].

According to Shoshana Zuboff, the experiences of people in these Digital Corporate Spaces become, according to Shoshana Zuboff, proprietary data streams and are used to improve products and services, as well as to build Predictive Signals - analyzed using Artificial Intelligence (AI) Computing Solutions - generating profiles that can anticipate present and future decisions, which are traded in Behavioral Futures Markets where Surveillance Capitalists sell certainties and seek Behavioral Capital Gains thanks to Action Economies that can predict, modify or generate behaviors. Overcoming the Economies of Scale that were produced in Taylorism and that are applied with Big Data, the Economies of Variety derived from Toyotism and associated with the capture of data in different digital corporate spaces are also overcome, [5].

On the other hand, at present, transindividualization as a process that generates a sphere neither private nor public derived from technique -which is not interindividual, like the General Intellect- has transformed work into a Force-Invention associated with thought, language and imagination that unfolds as a double transindividual-technical dimension and a transindividual-collective one. In that sense, a process of reification is generated thanks to linguistic, emotional and technical events that promote and demand the generation of a new third digital space, [6].

For example: Silicon Valley has created a fiction and has become the world reference. However, just as it has generated tension from the Ecosystem of the new corporate space developed by digital surveillance platforms, it has also generated a technological dream from the images of technological programs in a market controlled by an algorithmic rationality that presides over economic activity, as well as financing and austerity,

through a mixture of computer and AI services that manage to commodify information and the desires or preferences of individuals through the extraction and expropriation of data coming -many of them- from the sensory experience of individuals. This, because value is generated from the physical accumulation of data traces captured through facial recognition, smart sensors, virtual reality, or IoT, [7].

In this sense, abstraction is fundamental because the work becomes indirect, focusing on monitoring the behavior of automated processes and on the complexity due to the increasing interaction with microelectronic mechanisms. Therefore, it does not stimulate people's participation and development. Integrated information systems, on the other hand, have software that records the rate of interaction and errors of workers operating a computer terminal, allowing real-time monitoring of individual performance. However, it should be noted that, in general, these possibilities are by-products of the basic functions of information systems.

From this perspective, labor flexibility has taken a number of forms: 1) flexibility related to the quantity and distribution of hours worked (part-time, job sharing, flextime, flextime, annual computation of hours worked, flexible daily workday, quarterly work, shift work); 2) contractual flexibility (temporary, casual, fixed-term) and outsourcing; 3) work-life flexibility expressed in programs that provide for career suspension; and 4) flexibility related to work space (telecommuting and homework).

And, in line with flexibility, we can speak of an Online Civility associated with the digital conversion process. Such Civility is integrated by a set of practices and expectations that condition how the individual presence is manifested and the position that corresponds to it in an established hierarchical order. This is why the civilizing process generates a set of social norms and gestate affections and rules that guarantee self-control; which, according to Norbert Elias, allows us to speak of the Digital Environment as a *Habitus*, [8].

For all that has been described, a Digital Culture has been created that has promoted oscillations and political and sociological transitions; therefore, the Conversion from Analog to Digital presents characteristics of a Technical and Religious Conversion, which forces to carry out processes of reinterpretation and reinsertion of the old frameworks within the new frameworks; as

well as the generation of explanations to the new acts and the new facts.

In other words, Digital Culture is expressed as a new religion that brings its own language, which has remodeled the spoken and written languages; according to Jacques Ellul the Digital Technique is dehumanizing and anti-religious, which is linked to the "Automation of Decisional Processes" whose solutions are not conditioned by the need of the users but by the technical restrictions.

Therefore, *Digital Identity* is polyphonic by allowing a multiplicity and diversity capable of implementing different "Cultural Specificities" that allow interactions between the digital and the political. At the heart of the Informatic or Scientific Component of the Digital is the explanatory religious narrative function of the origin of the past and the future. This generates emerging forms of "Active Digital Citizenship"; with challenges and challenges to "Credibility and Legitimacy": because the so-called Digital Corporate Space generated by Social Networks privileges Presence over Analysis, Location over Substance, and Visibility over Relevance.

Finally, Digital Culture is composed of Modes of Communication and Information and Data Exchange that affect knowledge by the irruption of New Formats that operate in the so-called "Digital Environment", composed of associated tools, modes of access and navigation and exchange where each object is characterized by its position within it. Contemporarily, Video Games have contributed to establish the *Mental Models* that shape moral reasoning, political awareness and the understanding of actions associated with Active Citizenship, taking a place alongside literature, cinema or television.

This article, therefore, is the second part of a reflection on the management of *Non Rationality through Decisional Knots in the Project Society*; adding to the notion and phases of a project, the methodology for structuring it to respond to three common problems: 1) Fuzzy planning, expressed in objectives unconnected with activities; 2) Unsuccessful projects, or poor definition of scope; and, 3) Absence of a Vision or lack of an objective basis for comparing what was planned with what was achieved.

From the above perspective, the Logical Framework Methodology - and its graphical representation, the Logical Framework Matrix (LFM) - will henceforth

be viewed as an analysis of stakeholders and the prioritization of objectives, as well as for the selection of an optimal implementation strategy; i.e.: the project narrative that establishes the what to do and how, based on which key assumptions and how the project's inputs and outputs will be monitored and evaluated.

## 2. Rationality and Non-Rationality

There are three forms of Rationality, the Absolute Rationality of economists and engineers; the limited Rationality of psychologists focused on cognitive capacity; and the Social Rationality that conditions individual behavior. However, it is expressed that freedom of will little operates in the decisions of business managers facing the pressure of the environments, [9].

Complexity is conceptualized as a relationship between decisions, which make decisions work with each other, reciprocally qualify each other and are used as decisional premises, or as the power to decide; therefore, rationality is replaced by complexity.

The current concept of irrationality is that of incalculability, which means freedom of the will; but others think that incalculability does not exist in human behavior, emphasizing that everyday life is full of phenomena where chance is present and neither explanations nor causal relationships can be found. We also speak of irrationality when there is no interpretation of a behavior, that is, when there is no coherence associated with previous motives and it is expressed that many times the processes are not understood. When this occurs, people value or take a position in the face of what they do not know.

Non-Rationality, within organizations, is related to the multitude of interests that must be satisfied, so we can speak of a "contextual rationality" [10]; which allows, in different circumstances, to speak of different rationalities, or even of the "Subversion of Rationality. It also incorporates not only self-reference, but also heteroreference, which allows us to see an organizational rationality associated with adjustments to the environment, which does not respond to ends that affect the means.

The Logical Deficit of Rationality in organizations tries to be compensated by generating Decisional Knots or sets of linked decisions; routines are decision programs



subjected to communication and articulation; and they become the constituent elements of the organization through communication processes; the communication network privileges some options and conditions the valuation of alternatives, as well as constructs time lines thanks to past and future temporal connections.

Organizations are immersed in environments and are permanently adapting to them. The notion of future is built from decisions; accepting communicational agreements in a framework of probable or improbable. Society has the function of constructing horizons of meaning that act as environments, which supply organizations with communicative possibilities.

The Environment exists simultaneously with the organization, not before or after, time does not exist operationally, operations are closed, they are synchronized with the environment, but are modified by the immediate past, they have memory and calculation capacity.

Cognitive Routines or Decisional Premises are projections of culture, they are repertoires of repeated use recorded in communications that serve as value frameworks for the processes that build the Decisional Knots, of course their function is to absorb uncertainty, these are abundant in High Technology sectors, where “one must be able to remember what has never happened”, [10].

The reality of formally organized social systems is that they have possibilities of distinction, both successive and simultaneous. This generates a confusion, which is tried to be overcome by means of decisional processes or premises. This is why Organizational Culture operates in spaces where problems arise that cannot be solved by means of orders, culture helps to project decisions when it is not possible to decide or there is conflict as to how to decide.

Values are the ultimate component of organizational cultures. Organizational culture enjoys an ambiguity that gives them advantages over other concepts, it also allows to maintain a reference in the past and a link with the future; this makes sense in the case of innovation that contradicts the culture and is observed as a deviation, however, it appears invisible in front of the decisional knots; but it also explains that the organization is a non-trivial machine.

In synthesis, innovation is a counter-inductive decision process, in which one decides differently from what is expected, this occurs when considering feasible alternatives in highly differentiated cooperative processes; which demands a simultaneous reorganization of alternatives. Autopoietic closed systems have the temporal form of an event, which establishes the “before and after”, which generates the operations.

### 3. Project

The project, [11], is an undertaking, initially promoted by the Enlightenment, which was generated by science and faith in the progress of the nineteenth century, was taken up again in the 1960s, and it was the 1970s that brought it to the general public. Its temporality and transience make it the instrument that best represents postmodernity. Project management is at the heart of strategic companies, subject to a rapid rotation of their operations and to the redistribution of the structure in search of agility, horizontal.

The project arises historically from the separation between the conception of cathedrals and their construction, i.e. the division of design and execution, results from modern society, symbolizes the threshold of the Renaissance by the representation through drawing and future construction, which allowed the projection and design. The project environment is “mobile” but must meet the business objectives; and shall not change the initial condition of temporality of the projects, [11].

For example, the infrastructure works that remain as permanent testimonies of ancient civilizations show the early development and use of different project management techniques for the execution of infrastructure; the Pyramids of Egypt, those of Yucatan, the monumental works of China, Greece and Rome; as well as those of the Incas, the Aztecs and the Zeus.

In this sense, at the beginning of the 20th century, Henry Gantt, a disciple of Taylor, developed the Bar Chart that bears his name, [12], where the tasks necessary to execute a project, their duration and the temporal sequential position of such tasks are related. In the 1950s, the Critical Path Method was developed, at the same time that the U.S. Navy advanced the Polar Missile Project and used the Pert Method. Since the end of the 20th century, there has been talk of consolidation promoted by changes in the organization of work and business

activities in industry, towards a projection more in line with a Network Society.

That is to say: a project is an organized collective creation, with a set of established parameters related to time, resources and technical characteristics; around a need, [13]; but it is also a set of interdependent activities oriented to a specific end with a predetermined duration. It has a high level of uncertainty associated with the combination of resources, specificity of action, communication and coordination. And it is executed in parallel with the permanent and inherent processes of an organization. The project has two essential characteristics: Temporality, it has a start and end date; and Uniqueness, which differentiates it from organizational processes and routines and from other projects.

Therefore, the work has a unique approach that differs from others, for the achievement of the objective requires processes that are unique to its activities, as well as the repetition of processes that define the boundaries of the phase. And the closure of a phase ends with some form of transfer or delivery of the work produced as a deliverable of the phase; which must be approved before the phase can be considered closed.

Thus, within the set of actions prior to the formulation of a Pre-Project, it is required to understand if there is a Business Opportunity and a Business Model, probable in terms of technology and market analysis; as well as to

establish the conceptual definition of the project, which involves the realization and validation of prototypes.

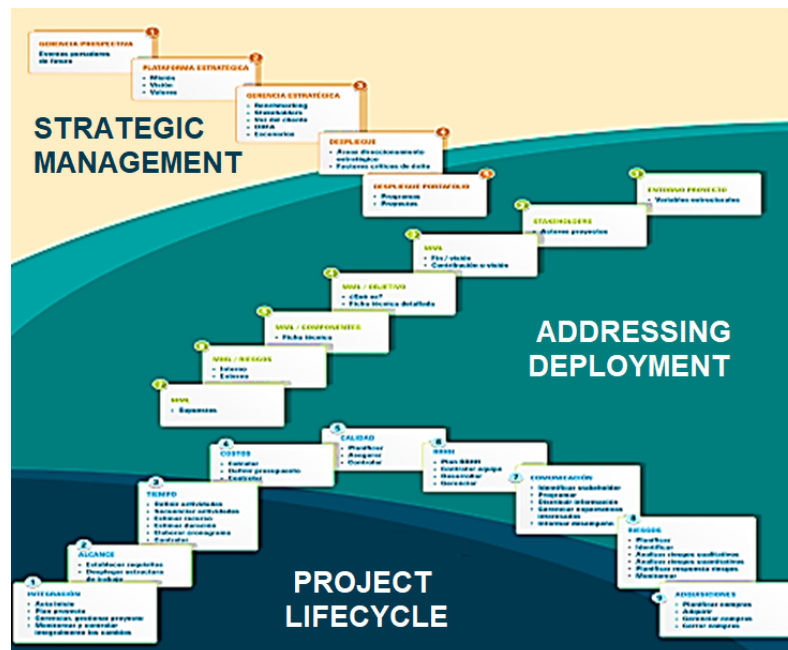
Then, deciding whether to carry out a project requires overcoming the evaluation of the probable financial profitability as materialization of the ideas; for which it is key to establish the needs of the clients, the analysis of the competition, the evaluation of the availability and reliability of the technologies as well as the characterization of the regulatory requirements; for this, the preparation is carried out to: Formulate the project; elaborate the Business Plan; develop the Business Model and the Business Model: Formulate the project; elaborate the Business Plan; and carry out the Detailed Plan of the project.

Figure 1 shows the relationship between Strategic Management, the Deployment linking the Logical Framework Matrix and the Project Life Cycle in the PMI conceptualization.

The Project Management seeks to achieve coherence and integrity and the scope comprises the management acts that go from the Construction of the Portfolio; to the actions comprised between the Preliminary Studies and the Putting into Production of the project; it can be characterized from Four Phases and Seven Stages:

A. Reflection: 1) Preliminary Study, try to squeeze and characterize the needs in a synthetic way and advance

**Figure 1.** Project Management based on Prospective Management.



Source: own.

a tour through the horizons of possible solutions and the supply and demand market; 2) Detailed Needs Study, model the needs and understand the core of the need.

B. Conception: 3) Functional Study, to establish exhaustively the functionalities to be satisfied; 4) Technical Analysis, to contrast the different functionalities with the technical solutions.

C. Manufacturing: 5) Realization, is to manufacture, purchase or parameterize the technical solution within the documents made; 6) Tests, which evaluate the needs, functionalities, technical solutions achieved, almost through a verbal process of conformity. D Putting into Service: 7) Putting into Production, for which post-market monitoring and surveillance actions must be established.

In this model, the planning activities are essential for the elaboration of the Preliminary Project, where resource needs are established, as well as the risks and assumptions that must be characterized; to understand the complexity of the conceptualization of the problem to be solved from the characterization of the planning, communication and learning activities; which demands the integration from the recognition of two domains: the Specific Knowledge associated to the handling of the required technology and the

Knowledge System associated to the sector; to be able to choose and understand the technical hypothesis and the industrial applications.

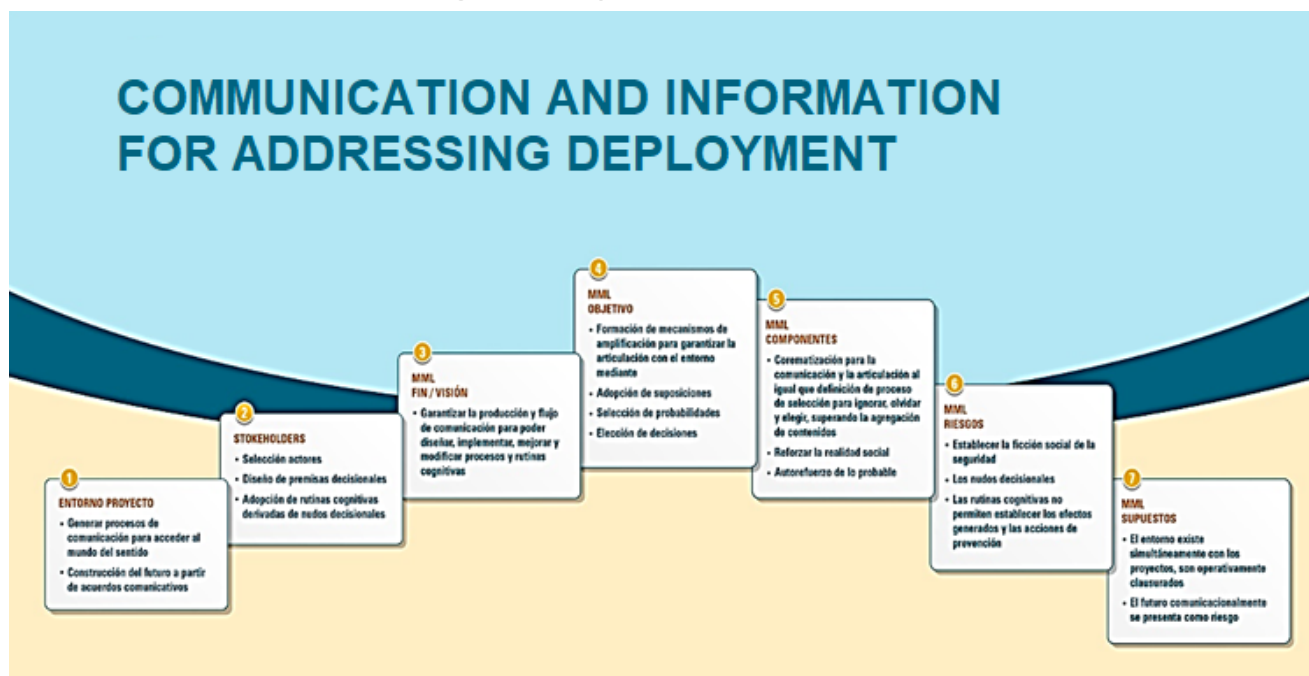
From all this, it is possible to advance an exploratory and a preparatory phase prior to activities such as: 1) The research around the techniques and procedures. 2) Market studies and Product Prospective. And 3) Strategic Reflection on the development of the Organization.

#### 4. Project Structuring through the Logical Framework Methodology

This instrument is used to support the conceptualization, design, implementation and evaluation of projects. Its emphasis is centered on the consensual construction by objectives, the participation of the beneficiary groups and communication among the affected parties.

The Logical Framework Methodology and its graphical representation the Logical Framework Matrix (LFM), Figure 2, is used for stakeholder analysis, to establish the hierarchy of objectives and for the selection of an optimal implementation strategy. While the Matrix is the project narrative that sets out the what to do and

**Figure 2.** Logical Framework Matrix.



Source: own.

how, from which key assumptions and how the project's inputs and outputs will be monitored and evaluated, it is typically used at all stages of the project.

The method responds to three common project problems: 1) Fuzzy planning, expressed in objectives that are disconnected from the activities. 2) Unsuccessful projects, or poor scope definition. And 3) Absence of a Vision or lack of an objective basis for comparing what was planned with what was achieved.

Thus, the MML Method provides: 1) A uniform terminology that improves communication. 2) A format to promote agreement among stakeholders on objectives, goals and risks or assumptions. 3) A common analytical agenda for stakeholders, i.e., stakeholders, consultants, and the project team to document. And 3) Focus on technical work on critical aspects and may shorten documents.

The Methodology represented above integrates two complex stages: 1) Identification of the problem and of the solution alternatives, where from the characterization of the existing situation a vision of the desired situation is built; as well as the possible strategies to achieve it are established. At this stage at least five types of analysis are carried out: of the Project Environment, of the Stakeholders, of Problems (image of reality), of Objectives (image of the future) and of Strategies (comparison of different alternatives). And 2) The planning stage, in which the idea or profile is converted into a practical operational plan for execution; which is modeled by means of the logical framework matrix; framing in time the activities and resources required.

Some of the activities to be carried out are: A). Analysis of the Environment, seeking to recover from the future-bearing facts of the scenarios, to see the behavior of the structural variables that affect and frame the project, which are risks not controlled by the project and must be monitored and are part of the logical framework matrix as assumptions that are not controlled but are considered at least indifferent to the project, but favorable to it.

B) Analysis of the Actors, people and groups, institution, organization or company with any link. Seeking to understand possible benefits, motivations and fears, as well as interests and expectations. The aim is to strengthen the support of groups with interests that coincide or complement the project, as well as to reduce the opposition of groups with interests opposed

to the project and mobilize the support of those who are indifferent to it.

C) Analysis of the problem to characterize the undesired situation to be modified; establish possible causes and effects. C). Objective analysis to describe the future situation to be reached once the problems have been solved. Transforming the negative states of the problem tree into solutions, expressed as positive states. D) Identification of alternatives that can solve the problem in operational terms. Seeking to remove the root causes to eliminate the problem.

E) Selection of the optimal alternative to achieve the desired objectives, applying the criteria established for the intervention. F) Analytical structure of the project (EAP) which represents the schematization of the project and is elaborated prior to the construction of the Logical Framework Matrix; it is structured from the bottom up and is useful for ordering responsibilities; it characterizes the most general features as a tree of objectives and activities, which summarizes the intervention in four hierarchical levels and establishes the elements of the Narrative Summary of the Logical Matrix of the Project.

#### 4.1. Project Formulation

The formulation or pre-investment stage establishes the project's objectives and analyzes its component parts. It develops the cumulative studies necessary to examine the technical, economic, financial, institutional and environmental feasibility, as well as the social suitability of the investment proposal.

According to the level of detail, it is called: "identification of the idea", "preliminary profile", "pre-feasibility study", "feasibility study" and "final design". The "Profile" studies use "secondary" information to guide decisions and present the bibliography used, the index with appendices and annexes.

The market study considers unsatisfied demand, current and projected supply, as well as prices and marketing channels.

On the other hand, the technical study establishes the relationship between supply and demand, as well as the criteria for defining location alternatives, the identification and selection of technological options and technical processes, and the approach to the business and management model. This includes the definition of



the activities to be developed and their chronology, in order to determine the start-up.

The financial study contains the investment budgets and schedules, in aggregate form and developed from updated quotations. The same as the cost budget organized by production, administrative, financial and sales costs. Revenue budgets estimated from production and prices.

The Evaluation: from the quantification of investments, costs and revenues estimating cash flows, to determine the financial benefits of the project.

Therefore, it is also possible to establish some moments in the projects: Idea, Formulation, Project, Execution and Start-up. On the other hand, it is possible to speak of phases such as: *"identification of the idea"*, *"preliminary profile"*, *"pre-feasibility study"*, *"feasibility study"*, and *"final design"*, in which the technical, economic, financial, institutional and environmental feasibility and social convenience of the investment proposal are examined.

Initially, the prefeasibility study: In this stage, a greater degree of detail is reached, in aspects of consumption, technical, financial, institutional, administrative and environmental aspects elaborated in the profile phase and resorting to primary information for some relevant variables, in order to contrast the hypotheses initially raised; resorting if necessary to primary information for some variables considered as relevant. This leads to the definition of an alternative that will be studied with greater rigor at the feasibility level.

Meanwhile, the Prefeasibility Studies do not include the sources of financing; they incorporate sensitivity analyses to establish modifications in the behavior of the project derived from changes in the relevant variables. At the end of the prefeasibility study, the level of information is improved to move on to the feasibility study, or to proceed to the final design, or to abandon the project temporarily or definitively if no advantages are found.

Instead, aspects of the socioeconomic environment are included; market analysis identifying the main variables that affect its behavior, such as product, demand, supply, commercialization processes, prices, etc.; defining size and location alternatives; also choosing a technical model and establishing the type of organization appropriate to the installation and operation stages; determining investments, costs and profits; and finally

applying financial, economic, social and environmental profitability criteria as the case may be.

On the other hand, the Feasibility Study: it is used to clarify the feasibility of the project in some of its fundamental aspects, the information is purified to establish with less doubts the evaluation indicators. The feasibility study demands high costs and time for its realization.

Therefore, the feasibility study must allow: The characterization of the project through market studies, the definition of the size, location, and technology; and also, the Design of the management model for each stage of the project. The estimation of the level of investments required and their timing, as well as the operating costs and the calculation of revenues. The full identification of financing sources and the regulation of commitments of participation in the project. Financial, economic, social and environmental evaluation for project approval.

And, the objectives of the feasibility study can be summarized in the following terms: a) Verification of the existence of a potential market or of an unsatisfied need. b) Demonstration of the technical feasibility and availability of human, material, administrative and financial resources. c) Corroboration of the advantages in financial, economic and social terms to allocate resources for the production of a good or the provision of a service.

Therefore, Preinvestment Studies include and incorporate the previous studies: 1) Full identification of the project through market, size, location and appropriate technology studies. 2) Design of the appropriate administrative model for each stage of the project. 3) Estimation of the level of investments required and their timing, as well as the operating costs and calculation of revenues. 4) Full identification of financing sources and regulation of commitments to participate in the project. 5) Definition of contracting terms and bidding terms for equipment acquisition works. 6) Submission of projects, if necessary, to the respective planning authorities. 7) Application of financial, economic, social and environmental evaluation criteria to provide arguments for the decision to carry out the project.

#### 4.2. The Project Life Cycle

It is made up of the set of phases that a project goes through from its inception to its closure; they are determined on the aspects of the organization, the sector or the technology to be used. The life cycle of a

project can be schematized in stages: 1) Project Idea: in which the central objective is defined collectively, the Chief's team and a description are established. 2) Start of the project: through the formation of the team, these are programmed, planned, the name of the project is established, the overall strategy is defined. 3) Project: it is defined in detail and validated by the team. 4) Realization, execution of stages and adjustments. 5) Use.

These are specific to the project and are generally sequential and determined according to the management and control needs of the organization.

Thus, project life cycle approaches can vary from predictive or strategic approaches to adaptive or change-oriented approaches. In a predictive life cycle the product and deliverables are defined at the beginning of the project and any changes in scope are carefully managed. In an adaptive lifecycle, the product is developed after multiple iterations and the detailed scope for each iteration is defined only at the beginning of the iteration.

In other words: all projects can be configured within the following generic lifecycle structure: 1) Project initiation. 2) Organization and preparation. 3) Work execution. And 4) Project closure.

Thus, the structure of the life cycle presents the following characteristics: 1) The levels of expenditure and personnel demand are low at the beginning and reach a maximum value in the middle of the development of the work and decrease when being close to the closure. 2) There is no typical curve associated with the life cycle related to personnel demand and expenditures. 3) Risks and uncertainty are highest at the beginning of the project and decrease as the project progresses. 4) The ability to influence and modify the characteristics is more possible at the beginning of the project and decreases as the project progresses.

#### 4.3. Project Phases

A set of project activities, logically associated with the completion of one or more deliverables; and usually linked to the development of a specific major deliverable. A phase may emphasize the processes of a particular Process Group, but it is likely that most or all of the processes will be executed in some way in each phase.

Project phases are usually performed sequentially, but sometimes overlap. These constitute an element of the project life cycle and can be divided by functional

objectives, intermediate results or deliverables, and specific milestones within the scope of work. The life cycle provides the basic framework for directing the project, regardless of the specific work involved.

Phase structuring allows the division of the project into logical subsets to facilitate planning, execution, verification and adjustment, see chart below. The number of phases depends on the size, complexity and potential impact of the project, and regardless of the number of phases that make up a project, they all have similar characteristics:

**Figure 3.** Areas of Knowledge in the Control Cycle.



Source: own.

Project Management Process Groups or Areas consist of activities that can be performed and repeated within each phase of a project, as well as in several phases of the project as a whole. There is no single structure that can be applied to all projects; and they can have significant variations, between a single phase or more phases.

The Knowledge Areas, Figure 4, comprise Nine according to the Project Management Institute PMI: Integration, Scope, Time, Cost, Quality, Human Resources, Communications, Risk and Procurement; which are related to the Management or Control Cycle or PHVA as illustrated in Figure 3. And below the Areas are modeled based on Stakeholder Management and then as conversational processes and some milestones

associated with this perspective are described from the organizational conversational fabric.

**Figure 4.** Areas of Knowledge in Project Management.

### The Knowledge Areas

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Source: own.

Sometimes one organization's standardization policies may consider a feasibility study as a routine pre-project, but another may consider it as the first phase of a project, and another may consider the feasibility study as a separate and independent project. Similarly, one project team may split a project into two phases, while another project team may opt to manage all the work in a single phase; or it may benefit from implementing overlapping or simultaneous phases.

Thus, there are two basic types of phase relationships: 1) Sequential relationship where a phase only begins upon completion of the previous phase. The step-by-step nature of this approach reduces uncertainty, but eliminates options for shortening the overall schedule. 2) Overlapping relationship, when a phase is initiated before the previous phase is completed; it aids schedule compression, in a technique known as rapid execution. Overlapping phases can increase risk and cause parts of a process to be repeated if the next phase proceeds before accurate information from the previous phase is available.

Predictive or Strategic Life Cycle is one in which the project scope, time and cost requirements are determined as early as possible in the project life cycle. These projects go through a series of sequential or overlapping phases, with each phase usually focusing on a subset of project activities and project management processes, Figure 5. The work performed in each phase is usually different in nature from that performed in the preceding and subsequent phases, and therefore the composition and skills required of the project team may vary from phase to phase.

Thus, at the beginning of the project, the project team will focus on defining the overall scope of the product and the project; formulating a plan to deliver the product. And then changes in the project scope are carefully managed and will generate adjustments in the planning and acceptance of the new scope.

**Figure 5.** Communication and Project Life Cycle.



Source: own.

Predictive life cycles are generally chosen when the deliverable is well understood, or when a product must be delivered in its entirety to be of value to stakeholders. Projects with predictive life cycles can use the concept of progressive planning, where a plan is started and then a more detailed planning is established and executed for the appropriate time windows, against activity demand and resources are allocated.

On the other hand, the Iterative and Incremental Life Cycle occurs when one or more activities are intentionally repeated within the project phases, called iterations. Iterations develop the product through a series of repeated cycles, while incrementals successively add functionality to the product.

Iterative and incremental projects can be developed in phases and these will be carried out in a sequential or overlapping manner. During an iteration, activities of all Project Management Process Groups will be performed. At the end of each iteration, a deliverable or set of deliverables will be completed. Future iterations may improve those deliverables or create new ones. Each iteration builds deliverables with a gradual incremental increase until the phase's exit criteria are met, allowing the project team to incorporate feedback.

In most iterative life cycles, a high-level vision for the overall undertaking will be developed, but the detailed scope will be worked out for one iteration at a time. The work required for a given set of deliverables may vary in duration and effort, and the project team may change during iterations. Those deliverables not included within the scope of the current iteration are usually defined only at a high level and may be tentatively assigned to a particular future iteration. Changes to the scope of an iteration are carefully managed once work begins.

Iterative and incremental life cycles are generally chosen when an organization needs to manage changing objectives and scope; to reduce the complexity of a project; or when partial delivery of a product benefits and generates value for one or more stakeholder groups without affecting the final deliverable or set of deliverables. Large, complex projects are often executed iteratively to reduce risk by allowing feedback and lessons learned to be incorporated between iterations.

In that sense, Adaptive Life Cycles are also known as change-oriented or agile methods that respond to high demands for variation and continuous stakeholder involvement. Adaptive methods are also iterative and

incremental, but differ from the above in that the iterations are very fast and of short duration and fixed cost. Adaptive projects generally run several processes in each iteration, although the initial iterations may focus more on planning activities.

Thus, the overall scope of the project will be decomposed into a set of requirements and work to be performed, called product-derived backlog. At the beginning of an iteration, the team will work to determine how many of the high priority items on the backlog can be delivered within the next iteration. At the end of each iteration the product should be ready for customer review.

This does not mean that the customer is required to accept the deliverable, but rather that the product should not have unfinished, incomplete or unusable features. Sponsor and customer representatives should be continuously involved in the project to provide feedback on deliverables as they are generated and to ensure that the outstanding work associated with the product reflects their current needs.

Adaptive methods are generally chosen in rapidly changing environments, when requirements and scope are difficult to define in advance, and when it is possible to define small incremental improvements that add value to stakeholders.

## 5. "Project-oriented" companies

Are those that structure project portfolios, develop alliances, partnerships and networks as a development of this approach. This situation has implications on strategic management, in particular, the ability to generate, select and execute projects becomes a core competency especially for their leaders. Highly elaborated support tools justify the use of this approach: for precision, quality, cost and customer satisfaction.

Decisions are generally "non-programmable" in Herbert Simon's terminology. This implies a trial-and-error process that gradually isolates and focuses the problem, taking into account risks and competitive responses. Some actions could be treated as cyclical repetitive processes that generate certain Routine Forms.

Contemporarily we speak of the "Projectization of Society" due to the need to generate innovations



permanently, which has generated three archetypes that adopt forms according to the advantages and needs to address unique initiatives: 1) Project Based Organizations PBO which is the oldest form of employment in engineering; 2) Project Supported Organizations PSO that allows the use of capabilities and knowledge; and 3) Project Work Networks PNW.

In general, it is accepted that a Task is a set of activities that consumes resources and time, while a Process is a set of tasks that contribute to achieve a specific result in a given time frame. Program is a set of interlinked projects with harmonized objectives, policies, goals and activities, to be carried out in a given time and space, with given resources. The program represents the action steps of strategic planning, the purpose of the programs is to ensure that the plan is actually implemented.

Predictive life cycles are generally chosen when the deliverable is well understood, or when a product must be delivered in its entirety to be of value to stakeholders. Projects with predictive life cycles can use the concept of progressive planning, where a plan is started and then a more detailed planning is established and executed for the appropriate time windows, against activity demand and resources are allocated.

### 5.1. Project Portfolio

At present there is talk of multi-project organizations and the need to structure Project Portfolios. This is a list of active projects that contribute to the same goal, separating the strategic or innovative ones that contribute to the development of the organization from the operational or functioning projects, which integrate the value chain of the company.

The portfolios must be built, executed and monitored in a uniform way, in terms of structuring these portfolios either Thematic and grouped by Strategic Direction Areas; or Functional and grouped by the large traditional Management Areas associated to the challenges of the sectorial directions.

For the above, Manchat's methodology establishes cards and instruments; it also characterizes four phases: Define, Build, Monitor and Valorize. 1) Define is to prepare the contraction of portfolios based on the strategy to be deployed, parallel to the formulation of a "Plan". 2) To build is to elaborate the portfolios following the functional areas. 3) To monitor is to coordinate the

defined portfolios between areas and levels. 4) To value is to budget how much the portfolio is worth and each project of such phases must also be formalized in the "Strategic Plan".

Afterwards, a checklist is elaborated, starting from the plan, which is deployed in strategic plans and in thematic or functional portfolios, generating the project sheets and developing the control panels.

However, one of the problems of project-based management is the decanting, documentation, standardization and preservation of knowledge to overcome the consequences of team termination and dissolution so works dedicated to project management emphasize practical improvements, but do little to address strategy and the tension with traditional values within an organization.

That is to say: Research and Development backgrounds have oriented the use of the project methodology as a strategy to develop activities, products, services or procedures of high innovative intensity, where it is required to deepen the differences with the standard procedures in force. This organization of activities responds to the Breakthrough Strategies that demand: 1) greater creativity; 2) reduction of the duration time; and 3) reduction of the total costs of radical innovations.

This is why there is confusion in the Anglo-Saxon literature about the terms Research and Development and innovation. Around the Definition of Value and the Identification of New Competences, there is confusion between the Development or coordination of interventions of the different functions to conceive, produce and commercialize products and services; starting from clearly determined characteristics in terms of quality, cost and delivery. While Research refers to something different, to produce knowledge from defined problems; it includes management of resources associated with the production of knowledge, tools, capabilities, expertise, databases. As well as management of the treatment of the issues raised.

On the other hand, Innovation is fundamentally an activity of exploration of new concepts, or new knowledge that then feeds research and development; with the challenge of discovering relevant research questions and use values that can generate new products, concepts and knowledge to explore new use value functions that are reedited in this dimension; which requires integrating

competences and traditional functions. When looking for a new idea, or a new technology to: 1) get rich; 2) make a big splash; or 3) show a big change. It is not in the thinking, or research, or science dimension; you are looking for the ultimate or the idea that makes a marginal, incremental or radical change that can change the world.

## 6. By way of conclusion

The term quality does not have a unique meaning, in everyday conversational language it is used to express both a sense of excellence, as well as goodness, merit, or superiority of something. It is also used as a critical judgment or appreciation of the best, as well as a synonym for nobility, lineage or aristocracy. In philosophical language, quality is a concept used throughout history to denote the constitution, nature or distinctive characteristics of something. For Aristotle it is one of the ten categories or fundamental predicates attributed to things as a way of defining being. Within the definition of the categories Aristotle defines qualities as that which obliges us to say of beings that they are in a certain way; this being the most basic definition. The first kind of qualities is formed by capacity and disposition. While for Thomas Aquinas it was a logical category, and for Galileo color, taste, smell, sound were qualities produced by bodies; and for Bacon it was the form or intrinsic order of the parts of matter.

### 6.1. Integral Quality.

The origin of the contemporary approach is found in the 1931 work of Walter Shewart, entitled *The Economic Control of the Quality of Manufactured Product*, this author states that quality comes from the Latin *Qualitas* which comes from *Qualis* meaning "how it is constituted" and expresses what a thing really is, so that altering the quality intrinsically alters the entity in its constitution. He recommends that the efforts of the organization should be directed not to discover and repair problems in the products, but to discover and repair problems in the processes. Adequate process control is considered more efficient than end-point inspection, this novel idea changed the way to guarantee and improve quality. The conceptual developments in the subject of quality initiated by Shewart, continued with Edward Deming his assistant; Joseph Juran, Philip Crosby, Kaoru Ishikawa, Ichiro Miyauchi, Masaaki Imai and Vicente Falcóni among others.

The restricted concept of quality of wide use, presents two complex aspects: 1) The Intrinsic Quality composed by the technical attributes that define the constitution of a good or service. And 2) Perceived Quality, composed of the perceptions of the users of a good or service regarding the satisfaction of their expectations. A quality product must be so, but it must also appear to be so; and for this reason, it must combine what it is with the impression it produces.

From the Technical Language perspective, quality is a function, a relationship, a status, or a condition of something. For example Juran, one of the leading theorists of quality, establishes eight ordinary meanings: 1) Level by which a specific product satisfies the needs of a given consumer; 2) Degree to which a class of products possesses potential satisfactions for the generality of consumers; 3) Degree to which a specific product conforms to a specific design; 4) Degree to which a specific product is preferred over other equivalents or substitutes, based on comparative tests; 5) Distinctive characteristic of a product, such as safety, reliability, or resistance; 6) Expression of the excellence that something possesses, but not so specific as to classify it; 7) Name of process or organizational function; and 8) Structural area of an organization.

For Ishikawa, meanwhile, quality makes people buy a good or service with satisfaction; and he adds that good quality is the best quality given production technologies and process capabilities; to guarantee the needs of users. He also mentions four aspects in the definition: technical quality, cost, delivery and service; this definition is expanded with the later works of Falconi. According to the latter, quality is "meeting perfectly, reliably, affordably, safely, and in the exact time the needs of a user". This expresses a multidimensional concept that includes, among other dimensions, the following:

1. The Technique, is the best application of the available knowledge and technology in favor of the client or user. It is what the professionals have known, it depends fundamentally, but not exclusively, on the qualities, capacities, training and technology.
2. Safety measures the risks that the services offered imply for the client; it depends on their condition, on the effectiveness of the defined strategy and on the skill with which it is applied. The safety dimension emphasizes that benefits

should not be achieved at the cost of increasing risks to the user or to third parties.

3. Service, because the interpersonal relationship with the client and the characteristics of the place where the service is provided must reflect respect for the user and must allow for privacy and comfort, and must be an integral part of the quality of the good or service, since they can have a decisive influence on the user's acceptability. Also added to this dimension are ease of access, timeliness and continuity of care; and recall.
4. The Rational Cost of care, affects the close relationship between the benefits and the risks that derive from it. Improving quality may imply increasing costs; but also, unnecessary or inadequate use increases costs without increasing quality and wasting resources that could be used to achieve greater social benefits; and whose cost affects access and continuity.
5. Human Team Disposition, recognized as a condition without which employee satisfaction is not a cause of good performance.

The physician Avedis Donabedian, established a scheme to understand the concept of quality of care composed of "Structure, Processes and Results", by collecting information on the presence or absence of attributes that condition quality. Structure refers to the stable characteristics of care providers, including all factors of production such as clinical staff, technology, financing, insurance and the way care is delivered. It is the basis of quality through resources and system design; licensing standards are mandatory and focus on the structure of the generators of goods and services. Processes are the series of activities carried out by and between professionals and patients; quality is assured through standards derived from innovations and the state of the art of medicine, as well as through the ethical values of society.

Processes are the way of organizing, designing and generating goods and services through the chaining of capabilities and competencies expressed through tasks, activities and processes; which are standardized in protocols or guidelines. The results are the changes derived from the structure and processes used.

Consequently, it is worth noting that currently, through the different strategies that organizations use

to guarantee their level of quality, several different qualitative levels can be characterized, which are built through a cumulative process: *Licensing or qualification by inspection, Certification, Accreditation and Excellence Models*. It is important that each organization, according to its degree of maturity, articulates and rationally orients its efforts to continuously improve and reduce risks to patients. Donabedian, established a scheme to understand the concept of quality composed of "Structure, Processes and Results", through the collection of information on the existence or absence of attributes that condition quality.

In the above perspective, it is important to conclude that Quality Assurance based on licensing by inspection is a process by which a governmental authority grants permission or "License" to an organization to operate or qualifies it. Licensing regulations are generally established to ensure that an organization meets minimum standards as a means of protecting users. The license for organizations is fully granted after an inspection to determine whether minimum quality standards have been met. Maintenance of licensure is an ongoing requirement that the organization has to meet in order to continue operating; it constitutes the accepted floor or minimum to ensure safety of care, the purpose being to protect public safety. Among others there are licensure processes for professionals and for institutions.

Such quality assurance based on process certification, in turn, is a process by which an authorized body, either a governmental or non-governmental organization, evaluates and recognizes an organization's process because it complies with pre-established requirements or standards. Today, ISO 9001 Standards are used around the world to establish minimum conditions required by customers from suppliers and have been adopted by the European Economic Community to regulate its trade flow. ISO is the International Organization for Standardization, an institution composed of a group of more than 100 National Standards Institutes, one representing each country, ICONTEC is the one representing Colombia, it was created after the Second World War as an independent organization. ISO is not only an acronym; it is also the Greek word meaning "equal". The principles on which the standards issued were established in 1994 and have been modified periodically have these components: 1) Customer-oriented organization; 2) Leadership; 3) Staff participation; 4) Process approach; 5) System approach to management; 6) Continuous improvement;

7) Objective approach to decision making; 8) Mutually beneficial relationship with the supplier.

Quality assurance based on Accreditation is a voluntary process in which organizations choose to participate, in which a recognized organization, usually a non-governmental organization (NGO), assesses and recognizes that an area or organization complies with published, applicable and pre-established standards. Accreditation standards are generally considered optimal and achievable and are designed to promote continuous improvement within organizations. The decision about the accreditation of a specific organization is made after an evaluation by a team and is usually reviewed every two to three years.

The following steps, among others, are followed: 1) Identify and document the mission processes. 2) Identify and document the support processes. 3) Draft the Quality Manual. 4) Establish and implement non-conformity requirements. 5) Conduct internal audits and external audits. All of which allows access to a Certification by an ISO authorized body.

Quality Assurance Based on Excellence Models: excellence models are a set of criteria grouped in areas that serve as a reference to structure and/or evaluate an organizational master plan that leads an organization towards Management Excellence; these models are based on the identification and characterization of key processes. The models developed have been referenced in the National Quality Awards developed under integral management schemes (Deming, Baldrige, Brazilian, Mexican, European, Ibero-American and Colombian); their original objective is to recognize the approach, implementation and results of procedures, processes, mechanisms, systems and results considered worthy of being emulated by all organizations and individuals in a country or region. The awards, therefore, must have features of generality that allow a global comparison of approaches, their implementation and the results achieved through the progress in the implementation of the approaches adopted by the organizations.

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