Hacettepe University Graduate School of Social Sciences
Department of Political Science and Public Administration
Public Administration Master Program

TRACEABILITY IN ONLINE PUBLIC PROCUREMENT PROCESSES IN COLOMBIA: A STUDY APPLIED TO THE ONLINE PROCUREMENT SYSTEM SECOP II

Iván David GAITÁN PAREDES

Master's Thesis

Ankara, 2020

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ACCEPTANCE AND APPROVAL

Iván David GAITÁN PAREDES tarafından hazırlanan "Traceability in Online Public Procurement Processes in Colombia: A Study Applied to the Online Procurement System Secop II" başlıklı bu çalışma, 24.06.2020 tarihinde yapılan savunma sınavı sonucunda başarılı bulunarak jürimiz tarafından Yüksek Lisans Tezi olarak kabul edilmiştir.

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DEDICATION

To a woman, who with her work, dedication and great love has dedicated years of her life to open the way to each of my steps. To a woman that defines for me the noun divinity, who, with her wisdom and great work, has always been present in my path. To a woman who is synonymous with strength, faith and hope. To her, to Esperanza, to my mother.

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ABSTRACT

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The evolution of public contracting in Colombia has allowed a substantial change of perspective and approach in relation to the role of contracting within the state apparatus. In recent years, the hiring process tends to be understood as a strategy that enables the fulfilment of objectives and that also allows these objectives to be carried out under fundamental principles of public management such as transparency, efficiency and effectiveness. The networked society open countless possibilities to optimize the relations and interactions between the members of society and government institutions, it is so in Colombia has been developed the online procurement process SECOP II for the management of contracting processes. Within this system, based on the mapping process analysis methodology has been studied the existing relationship between the purchasing entities and the suppliers within the contractual management process. This analysis has been done in order to understand the concept of traceability not only as a monitoring and observation tool, but as an instrument to obtain, organize and manage information. Traceability, as well as transparency, is an added value for the execution of processes in the public administration, which provides all kinds of data for the process optimization.

Keywords

Traceability, Online Procurement, Public Procurement, Suppliers, Buying Entities, Process Analysis, Measurement Indicator.

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LIST OF ABBREVIATIONS

Abbreviation	Meaning
CCE	Colombia Compra Eficiente Colombia Purchasing Efficiently
CUBS	Catalogo Único de Bienes y Servicios Unique Catalog of Goods and Services
GOL	Gobierno en Linea Government Online
ICT	Information and Communications Technology
IOT	Internet of Things
ISIC	International Standard Industrial Classification
PCM	Process Characterization Map
PF	Procedures Flowchart
RIA	Rate Intervention Analysis
RUP	Registro Único de Proponentes Unique Registry of Bidders
RUPR	Registro Único de Precios de Referencia Singular Registry of Reference Prices
SECOP	Sistema Electrónico de Contratación Pública Electronic System of Public Procurement
SICE	Sistema de Información para la Vigilancia de la Contratación Estatal System for Surveillance of State Contracting

INTRODUCTION

In recent years, public procurement in Colombia has ceased to be a support process, to become a management strategy to effectively achieve the purposes and objectives of government mission. Based on this, the Colombian Government has designed and implemented an online system within which the public contracting is managed. Public entities that wish to contract the acquisition or provision of goods or services may join this system, as well as admitting persons of any legal nature who are interested in being suppliers of the goods or services to be contracted by the state.

This online public contracting process facilitates the monitoring, control and validation of its stages not only by those who participate in it, but also by those who wish to monitor the processes in execution. The traceability of these processes then emerges as an attribute of quality that, together with transparency, gives an added value to the state public contracting, maximizing its effectiveness and reducing risks that hinder the fulfilment of the mission objectives of the state. The traceability situates in this study, like a concept of analysis for the greater obtaining of detailed useful and qualified information; information that can later help to improve the process and correct and prevent failures in the system.

This thesis starts from the analysis of online public procurement as a process, which is broken down to be studied in each of its parts, observing in detail the forms of relationship within the process, defining in turn the concept of traceability from of the levels of monitoring, operation, interaction and transaction by state entities and their suppliers, as defined by the SECOP II online system in Colombia.

1. CHAPTER I: DEFINITION OF THE PROBLEM

The first chapter of this document covers six points in which it is related the problem statement, delimitation, research questions, object of study and justification of the present paper to study the concept of traceability and the existing relationships within the online public contracting process in Colombia.

1.1. PROBLEM STATEMENT

Online public procurement in Colombia resulted in a series of elements and concepts that stimulate the exercise of the administration of resources in the state. Among these elements, particular reference is made to transparency and traceability as possible concepts from which indicators can be defined that potentiate control over public purchases by the state. Although the concept of transparency is much clearer and more concise when talking about online public procurement, *the concept of traceability is limited to an external vision and subsequent to the contracting management process itself.* In the new public management, traceability plays a transversal role to each process and product within an organization, reason why it should also be understood as a continuous monitoring that can help to understand in detail the organicity[1] in the public contracting management online system; and likewise for such analysis, obtain more important information about the existing relationships between the organizations, dependencies and/or people that interact within the process, and also the relations of these same with the administrative products.

1.2. DELIMITATION

The management of online public procurement in Colombia, for the present study, is addressed within the online system called SECOP II (Electronic system of public procurement), administered under the National Public Procurement Agency called

[1] Systems tend to become disorganized as an effect of the entropic energies that attack them, however, they have potential mechanisms that seek their survival. Now, the survival of these systems seems to be in their organizational capacity to keep organized against the negative changes and forces of the environment, and this is what is called organicity.

Colombia Compra Eficiente (Colombia Purchasing Efficiently), attached to the National Planning Administrative Department within the executive branch of the national order of the Republic of Colombia.

This system was launched in 2015, which is why the analysis is performed based on information generated and in force for the period between 2015 and 2017.

The motive of this document is circumscribed under the analysis of the concept of traceability within the SECOP II online system. Analysis performed from the interactions and operations defined in the procedures manuals of the mentioned system. These documents define the actions to be carried out by the purchasing entities and participating suppliers in the public procurement process in Colombia.

Likewise, for this analysis within the public procurement process in Colombia, the variability of the operations will be taken into account in accordance with the five main modalities of public procurement stipulated within the Colombian regulations.

1.3. RESEARCH QUESTIONS

1.3.1. Main Research Question

1.3.1.1. How varies the traceability in contracting modalities considering the buying entities and suppliers relation within online public procurement processes in Colombia?

1.3.2. Specific Research Questions

1.3.2.1. How online public procurement processes in Colombia has been established?

1.3.2.2. What are the factors that define the traceability through the relation between entities and suppliers in the online procurement system SECOP II?

1.3.2.3. What are the elements that enable the traceability in the online public procurement processes in Colombia?

1.3.2.4. How the traceability varies between the different contracting modalities within the online public procurement processes in Colombia?

1.4. OBJECTIVES

1.4.1. Main Objective

1.4.1.1. To explore the traceability concept through the relation of buying entities and suppliers in online public procurement processes in Colombia.

1.4.2. Specific Objectives

1.4.2.1. To sketch out how online public procurement processes in Colombia has been established.

1.4.2.2. To shape the factors that define the traceability through the relation between entities and suppliers in the online procurement system SECOP II.

1.4.2.3. To set forth the elements that enable the traceability in online public procurement processes in Colombia.

1.4.2.4. To analyse how the traceability varies between the different contracting modalities within the online public procurement processes in Colombia.

1.5. OBJECT OF STUDY

Traceability as a strategy for monitoring and analysing processes, within the different modalities of public contracting defined by the Colombian regulations, demarcated in the procedure manuals for the SECOP II online contracting system.

1.6. JUSTIFICATION

Regarding public procurement, it is important to highlight that the efforts that are being made to make their processes more effective and efficient are a strategy that encourages the best use of public resources, a principle on which is based an optimum service

provision by the state. The strengthening of public contracting nowadays is a determining factor for the fulfilment of the objectives of the state, since this one which to some extent guarantees the correct execution of the plans and government programs.

However, when information and communication technologies enter to support the work of contracting in the state, it is dynamic and tends to a different scenario that offers better opportunities to really reach relevant aspects such as transparency, economy, efficiency.

On the other hand, traceability within public contracting is a strategy that allows us to visualize this process in a much broader way, achieving greater perspective of its operation and thus develop new strategies or actions that help to optimize this process. However, traceability is not a concept that can be linked exclusively to public procurement, traceability can be observed within any organizational or even personal process that involves the transformation of an input to obtain a result through a particular procedure.

This is how the traceability analysis enables the optimization of any process within an organization and helps to understand the actors that interact within those processes. Understanding the flow of relationships and obtaining as much information as possible from the organicity of the processes helps to build a clearer profile of these and to predict how they work to reduce risks and improve the service.

The more detailed information can be obtained from a process, the better it could be restructured or transformed. Analogue process analysis developed strategies such as the study of workloads to improve the salary allocation of contractors and public servants. Now the analysis of processes within online systems provides a number of improvements for the organizations and their members in and even for the goods and services produced or provided within them. By having more information about relationships within a process, more attention can be given to the way in which these relationships occur. If it is known punctually how the participants act in a process, improvements to the system thought singularly for each one of the participants could be planted.

Later, understanding in greater depth the way in which buyers and suppliers interact in public procurement processes helps to understand new needs or opportunities of both the commercial sectors of the public sector and the supply that participates in public procurement processes.

If there is a greater detail on the processes that are being carried out for the acquisition of a certain good by the state, the profiles of those who have been providing a public entity could be registered, design the request sheets in less time, give faster and personalized attention to suppliers, open recruitment processes according to the needs of each organization more effectively, among others.

The originality of this work consists in establishing traceability as a potential variable for project evaluation. Most academic works and researches related to the term of traceability revolve around chemical, pharmaceutical, food and similar processes, but it has not been brought to the public sector or to the analysis of administrative processes. On the other hand, within this work, not only is studied the traceability term, but also the way to understand it from the use of process maps. This in turn offers more technical and effective elements to public management for the optimal achievement of its objectives.

2. CHAPTER II: LITERATURE REVIEW

The second chapter of this document covers four points in which it is outlined a background, a state of the art, a theorical framework and a conceptualization related to the aspects involved in the present study of the concept of traceability and the existing relationships within the online public contracting process in Colombia.

2.1. BACKGROUND

In the background of this document an approximation to the evolution of public administration, the buyers and suppliers' relation objectives, the traceability concept and some E-public procurement aspects are made, with the objective of observing some precedents regarding the axes of analysis necessary to understand the present perspective of the study object.

2.1.1. Brief Look at the Evolution of Public Administration

Owen E. Hughes (1994, pp. 131-132) states in his article *The traditional Model of Public Administration* a series of characteristic elements of the public administration crossings of the time, elements that are constitutive base of the analysis and the development of the administration, also taking into consideration the political, social and organizational state models and perspectives as fundamental variables for this observation. In the introduction to the analysis states the characterization of the traditional model of public administration as a model under a political leadership as a means of control, based on hierarchical structures of bureaucracy with invariable personnel, undisclosed and unaligned officials, arranged by the public interest, governing and serving equitably and implementing policies formulated by political actors. Characterization based on theories of authors as Woodrow Wilson, Frederick Taylor, Max Weber and the Northcote-Trevelyan Report.

It shows an early administration exposing examples of administrative systems in different chapters of history from the ancient Egypt, where basically the state figure resides in a personal representation, particularistic and linked to orthodox guidelines (depending on

the context and traditional aspects of a particular society). Perspective that is then polarized from Weberian theory following an impartial, logical, precise, and universalistic approach (Oszlak, 2006, pp. 18-20). Then the reforms in the 19th century under the understanding of modern theory seek to orient with a greater specificity the means and the actions in the hands of the actors within the administration, which gives way to the analysis of the bureaucracy as a hierarchical model where attention is paid to officials and their roles within the hierarchical structure of power. Then political control is seen from the Wilson approach, understood as an element that is in constant fluctuation between those who define the state, and those within the administration (George, 1981, p. 84). From Taylor's point of view, certain elements are defined and characterized within the management concept, and various discussions about the understanding of public administration from an organizational analysis, which then invites a new look at the administration and the different challenges that it brings (George, 1981, p. 87).

It is important to understand not only how the public administration itself has evolved, but also the way in which it is redefined and recharacterized based on the evolution of social dynamics and the evolution of political models and state fundamentalization. A particular community or society defines its own way of being governed, legislated and administered, from a theoretical approach, however, it is known that within that constitution play political variables and roles of power, which will then shape the form and methodology with which the administration of that state must act. Therefore, in order to understand the definition and the characteristic elements of the public administration, a parallel look must be made to socio-political dynamics, since according to them the concept of public administration varies from state to state. In addition, even the same organizations in charge of state administration do not always have to follow guidelines generically and universally, these will be re-designed, motivated by the objectives and interests of the government in turn. Thus, today in a projection to the future the public administration and its organizations, reconfigure or even get to rethink in the same foundations characteristics that were stated in the past.

After the organizational theories that study and propose development dynamics in the private sector, a new perspective emerges in the public administration that little by little

has been transformed into what is now called the new public management. This approach consequently introduces studies and analyses that have taken place in the private sector to the institutional sphere of the public. Within this perspective, among others, there is a relational analysis between the actors that integrate administrative processes, such as directors, organizations, public officials, organizations or their users; likewise, a study also emerges about who provides the organizations, understood as suppliers, and their relationship with the institutions they supply.

2.1.2. Buyers and Suppliers Relation

The management of the supply chain has become a relevant topic of study in recent years. According to María José Álvarez Gil (2006, pp. 14-15), in the research agendas proposed in the nineties for the beginning of the 21st century, it already appears as an emerging topic in the area of Operations Management[2]. Alvarez, in his article *Buyer-Provider Influence on Traceability İmplementation in the Vegetable Industry*, studies the company-supplier relationships in the framework of the supply chain. It focuses specifically on the variables that most significantly affect the integration of business-supplier relationships in the agri-food industry. Likewise, a special emphasis is placed on the influence that the implementation of traceability systems exerts over traditional schemes of analysis of the most influential variables in company-supplier relationships. Álvarez (2006, pp. 21-23) affirms that “traceability is a mechanism that requires and reinforces a maximum level of coordination between firms and suppliers, and between firms and retailers”. A variable is then pre-set that defines directly and punctually the relationship between agents within a process. The relationship between firms (which will later be called entities for purposes of studying the concept of traceability in the public administration), and suppliers is defined as a coordinated relationship for the correct fulfilment of the common and particular objectives of each of the parties.

[2] Relates aspects directed to planning and control, the planning and master programming of production, the philosophy "just in time", planning and control and suitability of the subsystem of operations, planning and control in the very short term, quality control and quality management, and stock management of finished products.

These relationships are subsequently addressed from a more detailed analysis, looking for tools for their measurement and then subsequently transform that information into an input for the generation of strategies, not only for the quality of the service, but also for the improvement of each one of the constituent elements of these processes. It is then when measurement as a process of continuous support (monitoring) and evaluation as a tool for control and continuous improvement, arise from the study of relationships between processes and members thereof, and in turn to increase the spectrum of analysis and management of the public.

Behn (2003, pp. 586-604), exposes that within the administrative processes, the stage of evaluation and/or measurement is not an end point after the completion of a particular process, on the contrary it is part of the process itself and responds to its nature and therefore to its objectives. Internal management, one of the new perspectives on the measure of performance, also understood as one of the pillars of the new public administration. Understood as a strategy, the measurement of results emerges as an aspect that shelters a certain process and helps a project achieve the missionary objectives of the organization. In the organizations, they are aware of the use of systematic measurement tools to help evaluating, controlling, budgeting, motivating, promoting, celebrating, learning and improving. Then it is observed that these are actions for which the systemic tools of measurement are applied, are different and respond to different dynamics, different modes of action of their actors, and different objectives, so the tools must also be particular and respond to each unique action. It is for this reason that the actors within the public administration should not limit their instruments of measurement, as if the concept itself responded to all their needs. On the contrary, the objectives set by the administration must be coordinated and understood simultaneously, hand in hand with the actions and procedures to be observed and measured, and finally, to integrate instruments and tools according to both the purposes and the actions. By such correlation and articulation, it is possible then, to achieve each of the strokes achievements to fulfil the purposes, is a process that must be understood in a holistic and integral way, where the evaluation is in itself an appendage of the nature of the purpose. Then, each of the actions of evaluating, controlling, budgeting, motivating, promoting, celebrating,

learning and improving within the organization must respond to a singular method that articulates to its respective function and objective.

The development of performance evaluation and measurement techniques in most organizations, and of course, in public entities, has been structured on the copying and repeated implementation of external models, designed and implemented by third parties. This has resulted in an ambiguous observation of the processes of each organization, which does not generate a clear, timely and corresponding improvement. Each organization is created in the state to fulfil different missionary purposes, therefore, although in the interior the support processes are similar to those of other organizations, these respond in a different way to the objectives and missionary processes of the entity. It can be affirmed that each process in an institution is planned and executed according to its criteria and the aspects of the define and characterize, then, the instruments of measurement, also must respond to such criteria and characteristics, since the measurement itself does part of the planning, implementation, evaluation and improvement procedures. It is based on this argument that, today, rather than continue to replicate and compile external evaluation measurement models, methodologies for the design, application, control and evaluation of indicators are being developed; indicators that are understood as objective measurement variables are designed according to the characteristics, principles, and objectives of each purpose within the organization.

It is important to consider the measurement of traceability as a tool that allows us to see the level of coordination between actors within a process and in turn with the products. Making a parallel with the analysis of software processes, the traceability arises from the need to be able to monitor compliance with the requirements throughout the life cycle of said process.

2.1.3. Traceability

Lindvall (1996, pp. 1161-1169), exposes traceability as a quality attribute that allows to validate and control the transformation of elements within a process. It is also defined as the ability to really determine how part of a procedure affects other parts in turn.

Traceability makes it possible to seek a change to a requirement and find its parts in the details of the production or provision of a service that are affected by the change.

In general, traceability methods and models, from software processing, carry out activities such as determining the elements to be drawn, tracing the elements of a model to another model, analysing the results of traceability, discuss uncertainties with developers and adapt models for traceability (Lindvall, 1996). Understanding this perspective within the public administration and the process analysis it is possible to affirm that traceability allows formulating the process components to be traced and traced from one procedure to another, analyse their results, generate preventive corrective actions and improvement with people that intervene not only in the design of the process, but also in its execution.

Traceability is determined by the different trace dependencies (relationships between plotted elements) that are valued by the participants (stakeholders) of the process. In other words, within a public procurement process, it is the suppliers and the purchasing entities that value and feed the traceability of the same process. They will determine the validity, flow, evolution, goals and priorities of the requirements.

Some general problems that could be detected when applying traceability are: faults in the specification of functional dependencies, both between levels of the hierarchy and between mission and support processes that intervene in the procedure (links and restrictions), poor analysis of dependencies of flow among components, emergence of reprocessing or isolated operations that do not contribute to the execution of the process, and lack of efficiency and missional consistency according to the missional objective of a process within its microcomponents or operational levels (Finkelstein & Gotel, 2007, pp. 9-14). This has caused that the conception and application of the traceability evolve from new techniques of analysis and design that make possible the trace and the check of the processes and the products and / or services generated from these, in a more dynamic way, reliable and consistent, at different levels of operability.

2.1.4. E-Public Procurement

Vaidya and Sajeev (2006, pp. 70-99) present a series of aspects related to online procurement that have been successful in certain initiatives in the public sector and develop a model of Critical Success Factors (CSFs). For this, they begin by explaining how numerous entities have identified Electronic Recruitment as a priority within public management and policies within E-Government: Reduction in the number of suppliers; consolidation of suppliers and contracts; centralization of contract control, product data, catalogues and price updates for indirect purchases; strong visibility of unit and individual expenditure; re-engineering of all business platelets effectively; enforcement purchases in the contract with preferred suppliers; analysis of purchasing behaviour of the final users; understanding preferred supplier technology plans and their ability to support e-procurement initiatives; implementation and maintenance of digitalized procurement rules; involvement preferred and strategic suppliers for e-procurement planning; selection of e-procurement software programs and services to follow the development of a solid business performance; deployment of balanced catalogue selection strategies.

There are certain factors that can affect the correct execution of an online contracting process, then it is important to highlight that this process has certain advantages for the institution or organization that executes it and takes advantage of it. Like any process, there are certain elements that can give value to the good or service processed and generated. Public procurement understood as a process also acquires a value at the moment in which it is executed and / or managed online, thanks to the use of information and communication technologies. Presutti (2003, pp. 219-226), exposes in his article the way in which nowadays electronic purchasing processes have strengthened the supply chains and give added value to their agreements. In the same way affirms that supply management is an aspect that has been developing and taking more form within the processes attached to the value chains, which in turn resignifies economic added values.

In the same way that online public procurement gives a new value to the production chains for the provision of public goods and services, the relationship between those who participate in such processes is redefined. Beltran and Giraldo (2007, p. 85) show how

public procurement is, according to the OECD, the most significant point of contact between the private sector and the public sector, which facilitates an environment of corruption. By making public procurement more transparent, not only is it intended to contribute to the control of corrupt practices, but other objectives are also pursued: "equality and non-discrimination among suppliers are promoted, participation of contractors who are not accustomed is facilitated to the operation of the system and its procedures, the base of suppliers and suppliers of the State is broadened, the decision-making process of the contracting administration is improved, the management of the administration is exposed to the public and to social scrutiny, compliance is promoted of the rules of the game and the results of the contracting processes become more predictable" (Beltrán & Giraldo, 2007, p. 85). In addition, globalization and the elimination of trade barriers for public procurement have forced countries to make their processes and rules on public procurement more transparent, allowing foreign suppliers and suppliers to participate in this activity. The creation of a common market necessarily depends on governments disciplining the preparation, selection and execution phases of their public contracts in a transparent way and at a transnational level.

It is possible to demonstrate this affection to the relationship between purchasing entities and suppliers at the moment in which variations are perceived within their processes, which in turn have an impact on the marked in which they interact. Sandy (2007, pp. 146-159) states that commercial activities, buyers and suppliers are increasingly concerned about the effects their participation in reverse auctions on their interorganizational performance (suspicions of opportunism, general satisfaction and future expectations). Based on an analysis of 25 quasi-experiments with 125 suppliers and $ 385 million in procurement contracts, it suggests that the greater the number of bidders, the greater the economic participation and the less visible the price in an auction, the more positive the impact on the interorganizational relationship.

The systematic components that make the possibility of using technological tools at the service of online public procurement a reality, places all those who interact in a digital scenario and systematizes processes in more detail, which in turn transforms not only the relationships between who interact within these processes, but also the way in which on

a larger scale, redefines such relationships in the marking. Munesa (2003, pp. 370-374) makes an analysis about the mechanical and systematic nature of the market from a social perceptive taking as an example a detailed study of the process of computerization of the Paris Stock Exchange: a market where the price determination process, traditionally carried out by auction, is now completely automated since the late eighties. therefore, a detailed analysis of the electronic quotation on the Paris Stock Exchange. The author raises the concept of "algorithmization" of a specific market requires complex and varied ways to explain its own mechanism, which requires a lot of engineering work, both technical and social, and causes controversies about the accuracy of price determination mainly considering the effects that an algorithmic configuration can have on the collective representation of value.

2.2. STATE OF THE ART

In the state of the art of this paper are drafted aspects such government and the network society, ICT for public procurement process and the traceability as an information strategy, with the objective of understand the dynamics and contemporary perspectives of the object of study of this analysis.

2.2.1. Government and the Network Society

In the last decades technological development has generated a new generation of concepts, social relations, and perceptions of the today's world. The government perceived as a macro-level state that seeks to administrate and manage processes and procedures at national, regional and local level, uses and approaches technological tools to achieve its goals, this relationship is called e-government, concept axis of this document.

With the technology revolution the society moves from the age of the PC to the internet and then to mobile generation and now ICT is a new paradigm shift. Transiting the fief and its development of agriculture, the economic and social system of the present humanity evolved until the industrial era, to later give way to the information age and

finally enter to the connection age, the network society. In our days, rather than focus on technological tools, the system demands new forms of relationship and connection. Technology is only a bridge that opens the perception of society to a next level of awareness of forms of interaction and creation. Then ICT ceases to be a passive use of technological elements to become a hyperdimensional field for the evolution of each and every aspect of each person's life. A new dynamic of the economy is emerging and been developed by higher degrees of open data, collaboration and citizen environment; simultaneously citizens have higher need and expectations in well-being, education, employment and environment fields. A clear example of the relationship and connection between government and society, citizenship and institutions are the Korean government that after its experience in online government exposes five different aspects that demonstrate its work in regards to the e-government (Global academy nia, 2016).

Connecting public services based in ICT, as the first aspect, shows how in a society where everything is connected through Internet of Things (IOT) new and innovative services are developed. These services are significantly transforming the society's relations and contributing to a new social foundation; with every devise being connected is possible to produce massive amounts of data, it means more opportunities to utilize this data and create added value services. As much as connected objects expanding and the frequency of connectivity increasing the public service area that connects the virtual and the real world is growing, this is because the IOT data can be harnessed and analysed to provide many different social and cultural services.

Using the large quantities of historical data, IOT provides personalized services to make predictive analysis, enhancing optimal decision-making capabilities and improving social and economic systems. In the area of natural disasters safety, Korea provides a service to forecast landslides, by using ICT, residents are immediately notified of any unusual signs detected. The ministry of public safety and security in Korea has developed a system that collects real-time information using cutting-edge sensors and closed television circuits (CCTVs), detecting any significant changes on the earth's surface or buildings in danger of collapse; the system also uses both wired and wireless communication to collect and transport data. The ministry of environment in Colombia and the seismographic

monitoring centers evaluate the volcanic activity of each of the volcanoes of the country, through devices connected to the national seismographic network, and thus alert any type of alert or danger of explosion or tremor.

Cloud-based intelligent government, the second aspect refers to cloud computing that integrates hardware, software and other information resources together and enables them sharing all this data online between individuals and organizations. Cloud technology, as the key component of e-government, integrate various government information resources into cloud computing achieve sharing and collaborating with other government organizations and support finding solutions national issues by using the integrated data. Korea wants to move to a government-wide integrated an open system in the cloud, it plans to establish a future-oriented cloud where policy related data and records are shared; in the future oriented cloud government public officials can share information and collaborate with each other more conveniently, they will be able to store work data in the cloud and all members of the department or organization can share and use the data without barriers instead of having to store data on personal computers. “It will be allowed public officials to make prompt decisions and handle their work on site using mobile devices” (Global academy nia, 2016). In Colombia ministries and institutes of national level hang in the cloud all the information related to procedures manuals and their respective documentation, indicators of efficacy, efficiency and effectiveness for the measurement of objectives, corrective preventive and improvement actions associated with each process within the institutions, and in this way permit that citizens, public servants and managers to access easily to this information.

Scientific services by using big data, being the third aspect in this description, argue that as more people use the internet and adopt smart device technology, the amount of user data produced is growing, therefore the government is able to develop nationwide strategies and scientific policies based on real-time data analysis. Big data enables the establishment of a more systematic approach, getting higher degrees of sharing between government ministries. In the National Institute Agustin Codazzi in Colombia, every year hundreds of microprojects are executed for georeferencing of geographic points across the national territory, through this information that feeds the database of geographic and

cartographic, the institute develops a project to predict the degrees and speed of movement of the terrestrial layers of Colombian territory.

Integration of communication services using mobile devices and platforms, forth aspect, focus in this mobile age where government organizations and public institutions are accelerating their mobile service development being the most effective means to enhance communication between the government and citizens as well as increased government work efficiency. Mobile enables seamless connectivity between service systems from anywhere and anytime, a reconfiguration about how government and citizens communicate with each other through social media or applications. The technological evolution is also requiring a huge change in the way government operates, mobile offers new possibilities and methods for finding solutions to social problems which previously had not been available. In Korea for example to collect critical information about crimes or accidents the National Police Agency has developed the citizen participatory witness information sharing system where through the mobile application citizens are able to easily report witness information or share evidence videos about traffic accidents or crime incidents, then the police can actively use the reported information for investigations; the collected photos or videos are interconnected with the traffic cop information management system and the criminal justice service information system within the National Police Agency providing helpful clues for cases (Global academy nia, 2016). In Bogota, the capital of Colombia, there are different applications for smartphone for district use in terms of procedures of citizens, one of them allows to request cadastral updates, to make payment of services to the district, to request updates of the unique tax register, and at the same time allows observing the stage of execution of each one of these procedures.

As the fifth aspect, services customized to an individual's lifestyle, an aspect where governments seek to innovate service delivery methods by anticipating the services that their citizens need, it means offering services and information when they need them instead of citizens having to find services for themselves. For example the ministry of environment in Korea produced an air pollution forecast service abled to be used by the website or by smartphone application called Air Korea, application where users can check

how polluted is the air around them on a real-time basis, this service provide information in advance to the elderly people with respiratory problems and school parents who highly valued the information for their health and convenience (Global academy nia, 2016). The Art District Institute in Bogota is developing an application that, through Facebook, filters information about cultural events in the city and notifies citizens who use the application, in turn, during the same event people can interact in real time inside the application and their publications in Facebook; opinions, comments, requests are linked to the event within the application, and so the institute not only makes more visible the cultural events in the city, but also captures information for the evaluation of its impact.

Online government (Gobierno en Linea GOL) is the name given to the e-government strategy in Colombia, which seeks to create a more efficient, more transparent and more participatory state through ICT. It means that the Colombian's government is focusing in provide the best online services to the citizen, achieve excellence in management, empower and build trust in citizens and promote and facilitate the actions required to advance the Sustainable Development Goals, facilitating the effective enjoyment of rights through the use of ICT. This strategy is subdivided in four axes that allow its execution: i) ICT for Open Government to build a more transparent and collaborative state, where citizens are actively involved in decision making through ICT. ii) ICT for services to create the best procedures and services online to respond to the most pressing needs of citizens. iii) ICT for management to give strategic use of technology to make administrative management more effective. iv) Security and privacy of information to save the citizens' data as a treasure, guaranteeing the security of the information (Colombia, Government Online Strategy , 2017).

In Colombia, as in many other countries, the government has realized that the use of ICT as an administrative tool is a potential public policy to achieve governmental objectives. Little by little the government ceases to be an all-powerful administrator of the public treasury, often corrupt, the origin of the greatest evils of contemporary problems, and becomes a true mediator between citizens and regulators and executors. It is through ICT that the government connects with its people, and at the same time with other levels of regional and continental governance. Technology is not a futuristic aspect, society has

been transformed and opens the way to new and challenging dynamics; good governance will be a term of the past, preceded by 'bad governance', the present now requires reconnecting not only economic, social, political, cultural and environmental aspects, but also reconnecting governance as a gift of service, citizenship as a human value and communication as a synthesis of existence.

2.2.2. ICT for Public Procurement Process

By means of the TIC, the fact of taking the management of the public contracting to an electronic platform in Internet plants a much more responsible action of the government with the use of the resources. Burazaco (2016, pp. 290-295), affirms that the importance of the public funds used in contracting makes an analysis of the struggle of general and particular interests in the execution of said resources indispensable. The European Union has recently approved a legislative package -known as fourth-generation hiring directives- that involves the transition to strategic public procurement and seeks to deepen the possibilities of "socially responsible public procurement" in compliance with the objectives established in the Europe 2020 Strategy. Public contracting as a complex system for the execution of public resources implies great challenges around standards and their interpretation, administrative and legal principles, and final impact on the execution of projects to take advantage of the society. This is when the online tool emerges as an instrument that minimizes the level of complexity in relation to the application of standards and principles, and the potential risks associated with public procurement.

For Smart (2010, p. 121) who says that "e-procurement acts are an important enabler of purchasing strategy implementation", affirms also that the importance and impact of online contracting depends a lot on the ways in which it is used, not only by the purchasing entities, but also by their suppliers. Then, for purchasing entities, online contracting and the tools to manage and carry it out, have considerable relevance, considering that they are the means to comply with the policies more effectively and facilitating the hiring process itself. This clearly implies that online public procurement, based on the means by which it is manipulated, transforms the forms of relationship by the actors in the process,

and in turn resignifies the way of understanding the process itself from the point of view of the process. particular perspective of each member of the process. The citizens, the institutions and the suppliers act each in the process in their own way, giving a different use to the online tool ready to manage the contracting process; and it is based on the way in which this instrument is used, which guarantees a high level of impact and importance for the government and its suppliers of goods and services.

According to the Bakland and Kilvik (2015, pp. 75-77) analysis, the online recruitment guarantees the increase in the measurement value of the efficiency indicators in terms of time, cost and economy, which implies from the beginning a transformation of the processes and consequently their re-engineering or reformulation. For such a design it is then important to highlight the importance of the information that can be obtained from the same processes, since it can show which are the points to improve, conserve, or suppress.

For Alonso (2015, pp. 37-41) the acquisition by the state of goods and services electronically increases the transparency rates of the procedure and, consequently, the administrative principles of equality, impartiality and legal security are strengthened, costs are reduced for natural and legal persons tenderers and for the public administration itself, the internal and international competitiveness of the country is strengthened, the procedure is given greater speed, and the single European market is strengthened by employing interoperable instruments and techniques. It also states that online contracting is not an analogue process in its entirety, since there are still procedures that are not linked to the online platform, but it is possible to speak in its entirety about the management of the contractual process.

According to Ruiz (2016, pp. 125-132) in his article *Electronic Contract*, the purest online contract would be given proportionally to the largest number of electrified phases, including execution, when the contract object is susceptible to transformation into bits, and payment is made through book entries or other digital media. Later, in the stock market, the processing of the information of economic indicators allows forecasting and projections of the execution of other contracts, which help decisions whose expression

can be monitored. Currently only the management of the contractual process is developed online, but effectively while more activities of this process and its execution are online, the greater the number of data and information that can be obtained to take its analysis to other areas and take better advantage their resources.

In Colombia, the Francisco José de Caldas District University in 2017 in a study conducted on the relationship of the population with online hiring processes, distinguished particular outstanding factors; cost-benefit, cultural resistance and conditions of state contracting, such as the existence of political will and bureaucratic requirements for implementation, associated with cost benefits. In addition, the factors of accessibility, safety, design, usability, investment and human management were rated as highly important with 90% average favourability in the surveys. The factors of accessibility, security, design, usability, investment and human management are synergistic and important for the success of the implementation of virtual platforms. The cost-benefit relationship, culture, political will and bureaucratic requirements are additional factors that must be taken into account when technological implementations are developed with government institutions (Carreño, Bermúdez, & Rojas, 2018).

2.2.3. Traceability, an Information Strategy

Traceability through product tracking has become a strategy for the success of different projects and programs in different fields of health, chemistry, or transport of food and beverages, among many others. For example, Ramirez (2015, pp. 19-21) exposes his case where he describes traceability as a method that helps management within health care organizations, developing instruments for the supply of medicines. By using codes to track products, it is possible to observe the location and status of each medication.

In the contemporary public administration and the new public management systems there is a constant analysis focused on the observation of processes, the surveillance directed to the administration, a constant monitoring that guarantees the fulfilment of the missionary objectives of the state and of course minimizes the risks of corruption and non-compliance with society. Larsson (2015, pp. 37-38) raises a debate about the

observation of data traffic in the network, as an instrument for monitoring and credibility of government actions. An observation defines as online traceability.

There is information and data within the government that is often limited from the norm to hide improper activities of the administration. Using Sweden as a case, the Larsson's study found that insofar as people have a greater perception of the processes executed by the administration, it generates greater credibility in the government (Larsson, 2015). Likewise, the amount of detailed information about the processes open to the public, helps the public to generate a more objective and constructive criticism for the processes of citizen participation.

Traceability is also used for the standardization of processes. Irribarra and Ficher (2015, pp. 71-85) expose a case of use of traceability to model the profile of students in a school and follow up on their process from that profile. It is an online model to outline and detail the characteristics of the student's process, which also evaluates and administers units of measurement to consistently model a student's diagnosis. The online accessible system gives teachers a tool to diagnose students and based on this being able to design a unique learning process for each student while having common axes of development for real-time assessment, logging, analysis, feedback, and reporting. The traceability allows to obtain all type of information with which later can formulate new strategies, analysis of results and prospects of improvement. It is a tool not only for the direct participants of the processes, but also for the heads of processes and executive directors in charge of processes. The traceability allows another type of management of the information for the improvement of processes.

From a comparative analysis between administrative processes and software processing, traceability is a critical element of any rigorous development process and it is a required component of the approval and certification process in most safety- and security-critical systems. For Mäder (2017, pp. 963-966) with the growing importance of these systems in our societies, traceability became a heavily studied research topic. Mäder affirms that nowadays, the subject of traceability has been eluded from the studies for the development of processes, but at the same time "manufacturers struggle in finding the

right degree of traceability for their needs and in establishing accurate sets of traceability links" (2017, p. 964) and also, this monitoring attribute has been demonstrated as being able to reduce development effort and to improve development quality. "Traceability research is often based on rigorous empirical studies to explore new research questions or to evaluate new tracing approaches" (2017, p. 965).

Nowadays there is the technology that allows to accurately track the path that a product travels in the production chain. The integration of the Internet, communication networks, wireless access, specialized software, mobile devices, GPS, among others, make the idea of being able to detect the exact point and the moment where an event occurred. Implementing instruments for monitoring, observation and obtaining data in administrative processes, provides the opportunity to see from multiple perspectives of analysis each of the components of these processes. The technologies offer this monitoring and generate the necessary data collected automatically, potentially increasing the opportunity to develop and redesign the processes and all aspects associated with them. The online traceability, then, can be said to be an analysis tool for obtaining information on processes, by a systematic and effective monitoring, control and validation of the aspects in transit within the same process.

2.3. THEORETICAL FRAMEWORK

The theoretical framework of this paper is sketched by an historical review, a legal framework, and a detailed observation of the public entity *Colombia Compra Eficiente* (Colombia Purchasing Efficiently), the online system SECOP II, and the concept of traceability, in order to understand theoretically and conceptually the aspects related to the object of study for the present analysis.

2.3.1. Historical Review

Prior to the Law of 80 of 1993, the history of public contracting in Colombia is basically framed by statutes that formulate fundamental principles and criteria of public contracting. With the arrival of the public contracting statute Law 80 of 1993 (Colombia,

Law 80, 1993), elements emerge that demarcate the public contracting in Colombia today. These are related:

- The generic term of “state entities” is established.
- Generalizes the denomination of contracts, calling them “state contracts”.
- It gives relevance to the concept of “public service”.
- Formulates the principles of the economic-financial balance of the contract and the contractual equation.
- The exorbitance regime arises.
- The selection procedure of the contractor is generalized through tender or public tender.
- The regime of disabilities and incompatibilities is extended, and the regime of responsibilities is extended assimilating the contractor, advisors, auditors and other contracting parties with the public servants, when they perform administrative functions.
- The Unique Registry of Bidders (RUP) is created, regulated by the commercial chambers.
- The Administrative Contested Jurisdiction has jurisdiction in the jurisdictional control of litigation arising from the celebration and execution of the contracts entered into by the administration.
- The figures of temporary unions and the promise of future association are introduced.
- Special regimes are established, such as those derived from the exploitation of non-renewable resources, telecommunications, assets, activities specific to industrial and commercial enterprises of the State and mixed economy companies.

In 2007 a reform to the general statute is made under Law 1150 of 2007 (Colombia, 2007) with which the following modifications are made:

- In addition to the public tender, the selection system called abbreviated selection, the merit contest, in relation to consulting contracts, and the concept of direct contracting is included.
- Within the selected selection, and specifically for the public market of supplies, the reverse auction system is created, or purchase instruments by catalogue

generated after the agreements of prices or of procedure of acquisition in bags of products and under the face-to-face or electronic modalities.

- Develops the Electronic System for Public Contracting -SECOP-, which seeks to unify contracting information by publicizing pre-contractual and contractual proceedings.
- New objective selection criteria are established as qualifying requirements and ponderable factors.
- It requires the timely publication of the specifications, studies and previous documents, to be submitted to the public, in such a way that allows the formulation of observations to its content.
- It makes the public hearing compulsory for public bidding processes and determines in which cases the acts of adjudication are made revocable.
- It specifies the term that the entity has to liquidate the respective contract.
- It submits to the state contracting the rules and principles of the administrative and fiscal management function, and specifically to the state entities that by legal disposition have an exceptional contractual regime.
- It makes explicit the power to impose punitive and sanctioning fines, which must be previously agreed in the specifications or contract and proceed as long as there are obligations pending execution by the contractor.
- It establishes the accreditation that the contractor is up to date in the payment of the parafiscal contributions related to the integrated system, as well as the so-called parafiscal contributions, when applicable.

In 2011, under the government of Juan Manuel Santos, *Colombia Compra Eficiente* (Colombia Purchasing Efficiently) was created as a decentralized entity of the executive branch of the national order, with legal status, its own assets and administrative and financial autonomy, attached to the National Planning Department (DNP), who is the rector of the Public Purchase System of Colombia.

The Organization *Colombia Compra Eficiente* entered to replace the Intersectoral Commission of Public Procurement, which had among its functions to serve as a scenario for the preparation and discussion of the regulations to be issued by the Executive to

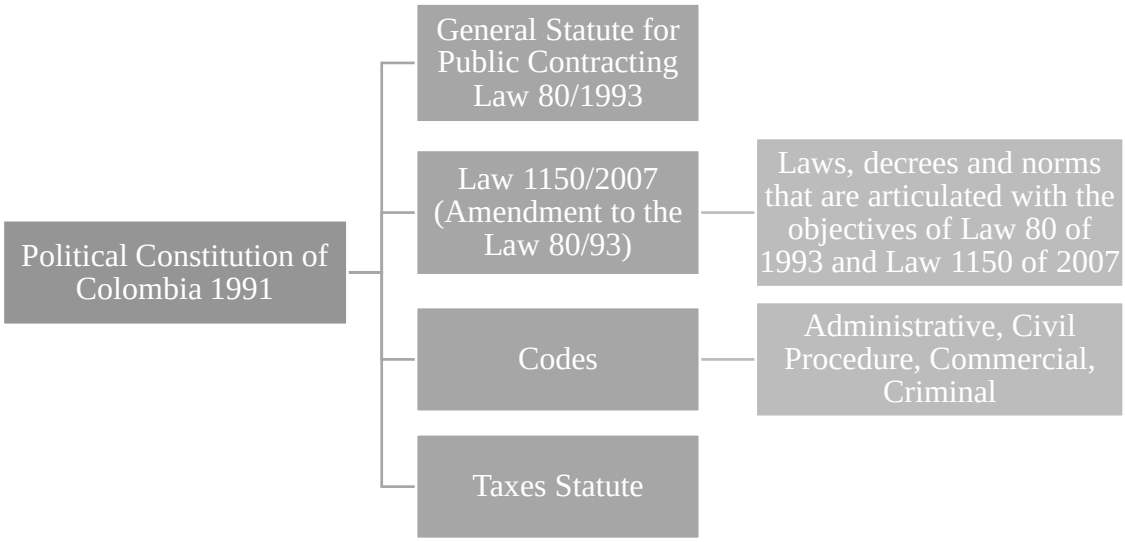
ensure the coherence, coordination and execution of policies in terms of public procurement, to establish parameters for adequate public contract management, among others, but lacking the tools that would allow it to fully comply with said postulates. For the realization of public purchase this program offers a system that allows online transactions, a database with information to make a decision to meet the goals and objectives of State Entities, the National Development Plan and Territorial Development Plans, ensuring that the use of economic resources destined for public procurement and procurement is optimized.

2.3.2. Legal Framework

In Colombia, public contracting is understood as a process that takes place when public entities make an agreement with legal or natural persons of the public or private sector to comply with some of their obligations. It has generally been associated with the provision of public services and public works contracts, among others. The public contracting is framed in the Colombian law in order to be an instrument to achieve goals outlined in the development plans, execute the budget, formulate rules for the use of public resources and be an incentive for private investment.

The normative framework of the Colombian public contracting is conditioned mainly by the *General Statute for The Public Contratacion* Law 80 of the year 1993, which later is supported by the Law 1150 of 2007, which in turn contains the decrees 066 (Colombia, 2008) and 2474 (Colombia, 2008).

Figure 1. *Normative Framework in Colombia*



Source: self-made

2.3.2.1. Political Constitution of Colombia

The Political Constitution of Colombia (1991) is the Magna Carta of the Republic, the norm of the norms, promulgated in 1991, in which the rights, guarantees and duties of the Colombian citizens and the State are consigned. This law, axis and legal principle of any guideline, was organized from the collective postulates of the declaration of human rights. From the public procurement approach, some articles directly related to it are highlighted; for example, article 83 states that: "the actions of individuals and public authorities must adhere to the principles of good faith, which will be presumed in all the those ahead of them". Other articles state articulation and responsibility of the State with public procurement, as stated in Article 90: "The State will respond patrimonially for unlawful damages that are attributable to it, caused by the action or omission of public authorities." In this way, all the actors involved in the hiring processes must comply with some constitutional duties, for which they are responsible for compliance with the provisions of all the regulations that govern them.

Some articles support the philosophy of the principles of public procurement, such as Article 209 that bases the principles in this activity. Regarding the delegation to public

entities, such as the responsibility to contract on behalf of the State, Article 211 states that: "... the delegator is exempt from responsibility, which shall correspond exclusively to the delegate, whose acts or resolutions may always reform or revoke that by reassuming the consequent responsibility. The law will establish the resources that can be filed against the acts of the delegates". With respect to the participation of Colombian companies in the process of contracting with the State, article 333 establishes that: "economic activity and private initiative are free, within the limits of the common good. For its exercise, no one may demand prior permits or requirements, without the authorization of the law."

2.3.2.2. Law 80 of 1993

The Law 80 of 1993 was created to be a general framework in which the contracting of the state should be developed, mainly observing the principles of transparency, economy and responsibility.

In public contracting, the principle of ***transparency*** refers to the stage of formation of the contract and is related to the fact that the entire state contracting must be done through bidding or public competition. With this it has been tried to avoid that the public contracting becomes a business of particular agents. It is then sought to have the largest number of equal opportunity options. The existence of certain contracts (direct contracting), which cannot be developed by bidding, does not imply that they can ignore transparency as one of the guiding principles.

The principle of ***economy*** refers to the efficient use of state resources. This principle aims to reduce the costs of hiring in order to avoid unnecessary procedures that out of their cost also encourage corrupt practices. It seeks to facilitate the access of the largest number of competitors by eliminating the possible "barriers" that prevent the participation of as many potential contractors. The principle of ***responsibility*** is based on the response that state agents must give to their act. Since the issuance of Law 80, the function of constrict that in head of the head or legal representative of the entity that hires, which can delegate it but in personnel of executive nature. The obligation of the public servants is reiterated, of protect always of the contractual process the interests of the State. Without acting

against the contractor or third parties. The norm also establishes the ***duty of objective*** selection understood as the impartial choice of contractors that best suits the interests of the State, considering the criteria that have been previously established by the entity to qualify and choose on equal terms the best proposals. It is not necessarily the lowest price that guarantees that a certain proposal is chosen.

The ***duty of publicity*** is understood as the action that allows all those interested to know the contractual process. The advertising via internet of the relative data of the contractual process is a massive means of communication with high potential of diffusion, able to guarantee the permanent access to the information to all the potential contractors and to every city that wishes to exert the social control. In the same way, precise procedures and terms are established in which the information must be published. With this provision, it is possible to expand the universe of possible proponents and contribute with a more objective selection.

According to the law in Colombia, public servants will take into consideration that upon signing contracts and executing them, entities seek compliance with state purposes, the continuous and efficient provision of public services and the effectiveness of rights and interests of the administrators that collaborate with them in the achievement of these purposes. Individuals, meanwhile, will take into account when entering into and executing contracts with state entities that (in addition to obtaining profits whose protection is guaranteed by the State), collaborate with them in the achievement of their purposes and fulfil a social function that implies obligations and responsibilities.

According to the Law 80 in its article 32, there are ***construction contracts*** that celebrate the entities for the construction, maintenance, installation and in general, for the realization of any other material work on real estate. A ***consulting contract*** is one that is understood as the necessary studies for the execution of investment projects, diagnostic studies, pre-feasibility, for specific programs or projects, as well as technical advice on coordination, control and supervision. ***Service provision contracts*** develop activities related to the administration or operation of the entity; in no case these contracts generate employment relationship or social benefits and are held for the strictly necessary term.

The ***concession contracts*** award a person called concessionaire the provision, operation, exploitation, organization or management, total or partial of a public service.

According to the Colombian regulations, five main contracting modalities are defined according to the needs of each entity and each sector of production and / or provision of goods and services. These modalities are listed below as they are defined by law.

a. *Public bidding*

In accordance with Law 80 of 1993, "public bidding is the procedure by which the State Entity publicly formulates a call so that, in equal opportunities, interested parties submit their offers and select among them the most favourable." Except special rule Public bidding is the general selection modality, that is, it is applied in all cases that do not have another modality assigned.

b. *Minimum amount*

The mode of selection of minimum amount is a simple and quick procedure to choose the contractor in the acquisition of goods, works and services whose value does not exceed ten percent of the smaller amount of State Entities. This type of selection has fewer formalities than the others and has special characteristics. The minimum amount selection method is applicable to all contracting objects when the official budget of the contract is less than or equal to the minimum amount of the State Entity, regardless of the nature of the contract.

c. *Direct contracting*

Direct contracting is a selection mechanism of the contractor, which operates in the cases set forth in numeral 4 of Article 2 of Law 1150 of 2007, which are:

- Loans.
- Interagency management, with the exception of the insurance contract.
- For the provision of professional services or for the execution of artistic works that can only be entrusted to certain natural or legal persons, or for the direct development of scientific or technological activities.
- Lease or acquisition of real estate.

- Express urgency.
- Declaration of deserted tender or contest.
- When no proposal is presented, or any proposal is adjusted to the specifications, or terms of reference or, in general, when there is a lack of willingness to participate.
- Goods and services required for defence and national security.
- When there is no plurality of suppliers.
- Products of origin or agricultural destination that are offered in the pockets of legally constituted products.

In this modality it is not necessary to receive several offers for the conclusion of the contract.

d. ***Merit Contest***

The merit contest is a selection method in which the contractor is chosen because of the greater technical, scientific, cultural or artistic capacity, in order to choose the most suitable person for the realization of the contractual object. According to the Law 1150 of 2007 "Corresponds to the modality foreseen for the selection of consultants or projects, in which systems of open competition or prequalification may be used. In this last case, the conformation of the prequalified list will be done through a public call, allowing to establish limited lists of bidders using, for example, criteria of experience, intellectual capacity and organization of the bidders, as the case may be". The consulting contracts, necessary to carry out studies necessary for the execution of investment projects, diagnostic studies, pre-feasibility or feasibility for specific programs or projects, as well as the technical advice of coordination, control and supervision, must be carried out under this modality.

e. ***Abbreviated Selection***

The abbreviated selection according to the Law 1150 of 2007 will be advanced in the cases in which the characteristics of the object to be hired, the circumstances of the contract or the amount or destination of the good, work or service, allow a simplified process, always guaranteeing the objective selection of the contractor. The law has determined as causes:

- The acquisition or supply of goods and services of uniform technical characteristics and of common use by the entities, which correspond to those that have the same technical specifications, regardless of their design or their descriptive characteristics, and share performance patterns and quality objectively defined.
- Minor contracting.
- Notwithstanding the provisions of Law 100 (Colombia, 1993) and Law 1122 (Colombia, 2007), the conclusion of contracts for the provision of health services.
- Recruitment whose bidding process has been declared void; in which case the entity must initiate the abbreviated selection within the four months following the declaration of void of the initial process.
- The alienation of State assets, with the exception of those referred to in Law 226 (Colombia, Law 226, 1995).
- Products of agricultural origin or destination that are offered in the pockets of legally constituted products.
- The acts and contracts that have as a direct object the commercial and industrial activities of the State Industrial and Commercial Companies and the Mixed Economy Companies, with the exception of the contracts that, by way of example, identify article 32 of Law 80 of 1993.
- The contracts of the entities, in charge of which are the execution of the programs for the protection of threatened persons, demobilization programs and reincorporation into the civil life of individuals and groups outside the law, including the attention of the respective family groups , assistance programs for the population displaced by violence, programs for the protection of human rights of groups of people living on the streets, children and young people involved in youth groups that have incurred in conduct against the economic heritage and sustain violent confrontations of different type, and highly vulnerable population with recognized exclusion status that require training, re-socialization and preparation for work, including the fiduciary contracts they demand.
- The procurement of goods and services required for national defence and security.

2.3.2.3. Laws, decrees and norms that are articulated with the objectives of Law 80 of 1993 and Law 1150 of 2007

Below are the rules that support, complement and expand articles and components of the General Statute for the Contracting of Public Administration (Law 80 of 1993) that articulate with the objectives and principles of this to facilitate the good development of public procurement in Colombia; in addition to those related to Law 1150 of 2007 and everything related to the reform of the Statute.

2.3.2.4. Decree 4881 of 2008

The decree 4881 (Colombia, 2008), partially regulates the Law 1150 of 2007, in relation to the verification of the conditions of the proponents and its accreditation for the Unique Registry of Bidders (RUP[3]), in charge of the chambers of commerce and other dispositions are dictated. Within its articles, the decree delimits the scope against some common precisions in the contracting, for example, the qualifying requirements. These are defined as the legal capacity and the appropriate conditions -experience, financial capacity and organization of the proponents- required for participation in the selection process, in proportion to the nature of the contract and its value. For verification, entities will require them in the specifications, under the same parameters that are included in the certificate issued by the Chamber of Commerce.

2.3.2.5. Decree 066 of 2008

As of January 16, 2008, this decree gives effect to and regulates Law 1150 of 2007. However, Decree 2474 of July 31, 2008 repeals it, with the exception of its Article 83, in which a derogation is made to other regulations, which lose validity in their opinion.

[3] Registro Unico de Proponentes (Unique Registry of Bidders) is a record of legal creation carried by the chambers of commerce, in which national or foreign individuals or legal entities domiciled or with a branch in Colombia that aspire to enter into contracts with state entities for the execution of works must register to supply of goods or provision of services, except for the exceptions specified in the law. This register includes information related to experience, legal capacity, financial capacity, organizational capacity and classification of the proponent.

2.3.2.6. Decree 2474 of 2008

The decree 2474 of 2008, issued on July 31, partially regulates the Law 80 of 1993 and the Law 1150 of 2007. Its purpose is to apply the selection modalities and indicates provisions in matters of publicity, objective selection and other aspects related to the public procurement processes. This rule repeals decree 066 (January 16) of the same year. Among the types of selection that it raises and describes, are: public bidding, abbreviated selection, merit contest and direct contracting. Likewise, it broadens considerations about the previous studies that the public entity must carry out, and the entire process, depending on the type of selection of the contractor, the foreseeable risks and the guarantees, as well as on the publicity of the procedure in the SECOP, among others.

2.3.2.7. Law 816 of 2003

Through this standard, the national industry is supported through public procurement (Colombia, 2003). In its article 1 it decrees: “The public administration entities that, in accordance with the legal regime of hiring that is applicable to them, must select their contractors through tenders, calls or public competitions, or through any contractual modality, except those in which the law does not force to request more than one proposal, will adopt objective criteria that allow supporting the national industry”. In addition, this law encourages Colombian industry to participate in the procurement processes and offer national goods and services. In this way, regional trade and quality is developed among the participants.

2.3.2.8. Decree 327 of 2002

Decree 327 (Colombia, 2002) is a standard issued by the Ministry of Justice and law, by means of which the 2504 of 2001 is repealed and paragraph 3 of article 41 of Law 80 of 1993 is regulated. In its articles, it orders the publicate all contracts entered into by the state entities indicated in Article 2 of Law 80 of 1993, which, according to article 39 of the same law, they must be done with full formalities and those without full formalities

whose value is equal to or greater than 50 current legal monthly minimum wages (CLMMW[4]). This action allows communication with the public, in general, and strengthens the principle of transparency and the action of citizen oversight.

2.3.2.9. Decree 2170 of 2002

The decree 2170 (Colombia, 2002) was repealed by the 2474 of 2008, with the exception of articles 6, 9 and 24. Article 6 motivates the consultation of prices or market conditions in the selection processes of goods and services, through the Unique Registry of Reference Prices (RUPR[5]) through the Information System for Surveillance of State Contracting (SICE[6]). The RUPR is regulated and regulated by Law 598 (Colombia, 2000).

2.3.2.10. Law 598 of 2000

In order to achieve the modernization of public contract management, in pursuit of greater efficiency and transparency in government procurement, this law creates the Information System for Surveillance of State Contracting (SICE), the Unique Catalog of Goods and Services (CUBS[7]), and the Unique Registry of Reference Prices (RUPR), of goods and services commonly used in public administration.

2.3.2.11. Decree 62 of 1996

Article 38 of Extraordinary Decree 2150 of December 5 of 1995, is clarified by Decree 62 (Colombia, 1996), which only modified the smaller amount for purposes of public

[4] A current legal monthly minimum wage in Colombia for the year 2018 is COP $ 781,242, equivalent to USD 280 at an exchange rate of COP 2,793.74 per USD (03/29/18).
[5] Registro Único de Precios de Referencia (Registry Unique Reference Prices) is a is a system within which the prices of goods and services in the market are charged according to the demand and supply of the same in order to inform values as objectively as possible and avoid additional demands on their value.
[6] Sistema de Información para la Vigilancia de la Contratación Estatal (Information System for State Contracting) is an information, order and control tool that incorporates the relevant figures of the state contracting process, in order to compare them online and in real time.
[7] Catalogo Único de Bienes y Servicios (Unique Catalog of Goods and Services) is a system of information about products and services in a clear way since it is based on standards agreed by the industry which facilitate trade between companies and government.

procurement of public entities, whose annual budgets are less than 12,000 CLMMW. The corrected article is as follows: “For the purposes of public procurement, the following amounts shall be understood as a lesser amount, determined in accordance with the annual budgets of public entities, expressed in minimum monthly legal wages CLMMW”. However, Law 1150 of 2007 modified the amounts in public procurement.

2.3.2.12. Decree 287 of 1996

The articles of this regulation were repealed by Decree 2474 of 2008, except for Articles 3 and 4 (Colombia, 1996). Article 3 specifies the award period within a process, which will be counted from the day following that in which has expired the term provided in article 30, numeral 8, of the Law 80 of 1993. While article 4 establishes the term of the ordering, numeral 7, of article 30, of the Law 80 of 1993 guarantees the duty of objective selection. This term, which according to the Civil Code is the time that is set for compliance with the obligation, may not exceed the term initially defined.

2.3.2.13. Decree 1477 of 1995

In short, decree 1477 (Colombia, 1995) regulates the publication of contracts in the Single Journal of Public Procurement and determines the minimum content that must be included in its processing.

2.3.2.14. Law 190 of 1995

By which rules are issued to preserve morality in public administration and provisions are established in order to eradicate administrative corruption (Colombia, 1995). One of the control systems dealt with in chapter IV, literal b, refers to social control as a mechanism for monitoring public resources. In general terms, this law contextualizes aspects related to the regime of public servants, their recruitment, the Single Personnel Information System in the Administrative Department of Public Function (DAFP[8]) and

[8] Departamento Administrativo de la Funcion Publica (Administrative Department of Public Function) is an entity designed to formulate, implement, monitor and evaluate the administrative development policies of the public function, public employment, human talent management, public management, the

declaration of assets and income. Likewise, aspects of information on the management of the entities and the processing of complaints and claims.

2.3.2.15. Decree 2150 of 1995

procedures or unnecessary procedures existing in public administration. It is based, among other provisions, by Article 209 of the CPC, which states the following: “The administrative function is at the service of general interests and is developed based on the principles of equality, morality and efficiency, economy, speed, impartiality and publicity, through decentralization, delegation and deconcentration of functions”.

2.3.2.16. Decree 679 of 1994

This decree regulates the requirement of the single guarantee (Colombia, 1994). The Commercial Code, amended by Article 1 of Law 389 of 1997, defines insurance as: “A consensual, bilateral, onerous, random and successive contract”. The doctrine, on the other hand, adds characteristics of being strictly compensatory, of adhesion and of good faith in the hiring processes.

2.3.2.17. Decree 2681 of 1993

It partially regulates public credit operations, public debt management operations, their assimilated and related ones and the contracting attached to them (Colombia, 1993). Authorizes internal and external debt operations of the nation, such as operations for the restructuring of credit obligations of the public sector, specifically to celebrate and guarantee external public credit operations, destined to finance programs and projects of economic and social development.

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performance of public functions by individuals, administrative organization of the State, planning and management, internal control, citizen participation, transparency in public management and citizen service, promoting the materialization of the guiding principles of the administrative function.

2.3.2.18. Decree 92 of 1998

Decree 92 (Colombia, 1998) regulates the registration phase, registration, classification and qualification of the proponents. Its legal framework is based on Article 22 of Law 80 of 1993 and is valid for one year from the date of registration.

2.3.2.19. Information System for the Surveillance of State Contracting

This complex information system has the function of guaranteeing the articulation, efficiency, effectiveness of the contractual processes, and avoiding duplications. It was created as a tool for monitoring the fiscal management of the public administration and of individuals or entities that manage public resources. It has its own conditions, as follows: 1) it is made up of subsystems, methods, principles, instruments and other aspects that guarantee the exercise of fiscal control in accordance with the administrative acts issued by the Comptroller General of the Republic; and 2) the Office of the Comptroller General of the Republic (CGR) may contract as operator, the administration of SICE subsystems or instruments, in accordance with the methods and principles defined by the Comptroller General of the Republic.

2.3.2.20. Unique Catalog of Goods and Services

The Unique Catalog of Goods and Services (CUBS) is defined as: “set of codes, identifications and standardizations, among others, of the goods and services of common use or use in works that state entities contract to guarantee the transparency of the contractual activity in fulfilment of the purposes of the State”. According to the circular 001 of January 2008, of the CGR, it corresponds exclusively to the administration and management of the CUBS. Currently, this institution and the national government are studying the possibility and relevance of reclassifying the contents as well as modifying the structure of the CUBS to make it useful for purchases by electronic means and for the exercise of fiscal control.

2.3.2.21. Unique Record of Reference Prices

The Unique Registry of Reference Prices (RUPR), is a standardized index of prices for goods and services, identified by code, by type, class, subclass, group and attributes that make up the CUBS. Article 3 of Law 598 of 2000, states that: “suppliers must register in the RUPR, the prices of goods and services for common use or use in work contracts that are able to offer to the public administration and the individuals or entities that handle public resources”.

2.3.2.22. International Standard Industrial Classification

The registration and classification information generated by the Chambers of Commerce, to perform a classification of economic activities through the International Standard Industrial Classification (ISIC). Its objectives are: 1) to be an instrument of the statistical production process for each of the economic sectors, and 2) cover the economic structure of the country through a wide range of activities and organize the statistical information of the country's economic structure.

2.3.2.23. Commercial Code

The Commercial Code was issued by decree 410 of March 27 (Colombia, 1971). Its normative axis is established in order to regulate the activities of merchants; It provides the requirements for the formation of commercial companies, the functions of the regulatory entities in this regard and other commercial operations that are carried out in the national territory. In 1995, Law 222 modifies Book II of the Commercial Code and issues a new regime of insolvency proceedings and other provisions are issued. For purposes of public procurement, this rule is important because it defines some commercial figures and terms that are part of the contractual dynamics with the State.

2.3.2.24. Civil Procedure Code

The Code of Civil Procedure was issued by decrees 1400 and 2019 (Colombia, 1970), and modified by decree 2282 of 1989. This document defines the general principles of procedural law, so that it is complied with the constitutional guarantee of due process, the right of defence is respected, and the equality of the parties is maintained. It is applicable to people, goods, successions, obligations and contracts. For this last case, its relationship is direct from the civil and Article 1602, in this regard, reads: "Every contract legally concluded is a law for contractors, and cannot be invalidated except by mutual consent or for legal reasons".

2.3.2.25. Penal Code

The relationship of the Criminal Code in public procurement begins with compliance with the principle of responsibility, which applies from the preparatory phase and previous requirements because in this phase the budget and pre-feasibility studies are carried out. make the projection in a process of contracting a good or service. From the perception of the criminal law, it is defined as the existing capacity in every active subject of law to recognize and accept the consequences of a fact freely carried out.

2.3.2.26. Administrative Contentious Code

This document defines the guiding principles of administrative activity in Colombia. Decree 01 of 1984 and Law 446 of 1998 modify it and issue regulations on decongestion, efficiency and access to justice (Ramos, 2016). Article 86 of this code, subrogated by Article 31 of Law 446 of 1998, addresses procedural aspects inherent to public procurement and announces situations in which the interested party may resort to direct reparation action.

By means of Law 734 of 2002, the Disciplinary Code is issued, which regulates the actions, in general, of all public servants. Develop duties and prohibitions; likewise, those consigned in the Law 190 of 1995 will be integrated into this code. In particular, it refers

to compliance with the laws and rights of Colombians, such as their functions in the position, the procedures manuals and the hiring of entities, adequate use of public resources and the reporting of disciplinary offenses (Ramos, 2016).

2.3.2.27. Tax Statute

Decree 624 (Colombia, 1989) regulates the Tax Statute. This rule establishes the law regarding taxes administered by the DIAN. This article is the starting point for the construction of the obligatory elements contained in the financial component of a tender document; however, it is complemented by the self-rating factors required by decree 92 of 1998 for the RUP and the considerations of the Commercial Code in this regard. That is to say, that every person that contracts with the State must present the respective documents that accredit it to be at peace and save in tax matters.

2.3.2.28. Decree Law 4170 of 2011

Colombia Compra Eficiente (Colombia Purchasing Efficiently)

In Colombia, the government recognizes that the purchase and public procurement is a strategic issue, which is why it decided to create *Colombia Compra Eficiente* through Decree Law 4170 of November 3, (Colombia, 2011). Decree Law 4170 recognizes the need to: (a) create unified policies to serve as a guide for purchasing managers and to monitor and evaluate the performance of the System and generate greater transparency in purchases; and (b) have a Governing Body that provides adequate support to execute the Development Plan.

The functions of *Colombia Compra Eficiente* are:

- The formulation of policies, plans and programs seeking to optimize supply and demand in the public purchase market.
- The normative rationalization for greater efficiency of operations.
- The development and dissemination of policies, rules and instruments to facilitate purchases and promote efficiency.
- The coordination with other State Entities for the fulfilment of its objectives.

- The elaboration of studies, diagnoses and statistics to improve the effectiveness of the System.
- The acquittal of consultations on the application of the rules and issuing circulars on the matter.
- Support to the Government in international negotiations regarding public procurement.
- The design, organization and conclusion of Framework Agreements and other instruments of aggregation of demand.
- The development of e-procurement tools within the Public Purchase System.
- Support to Suppliers to facilitate and improve their participation in the Public Purchase System.
- The dissemination of best practices and the coordination of training programs with other State Entities.
- The support to the territorial entities in the management of purchases.

Colombia Compra Eficiente is a member of the Inter-American Government Procurement Network (RICG[9]).

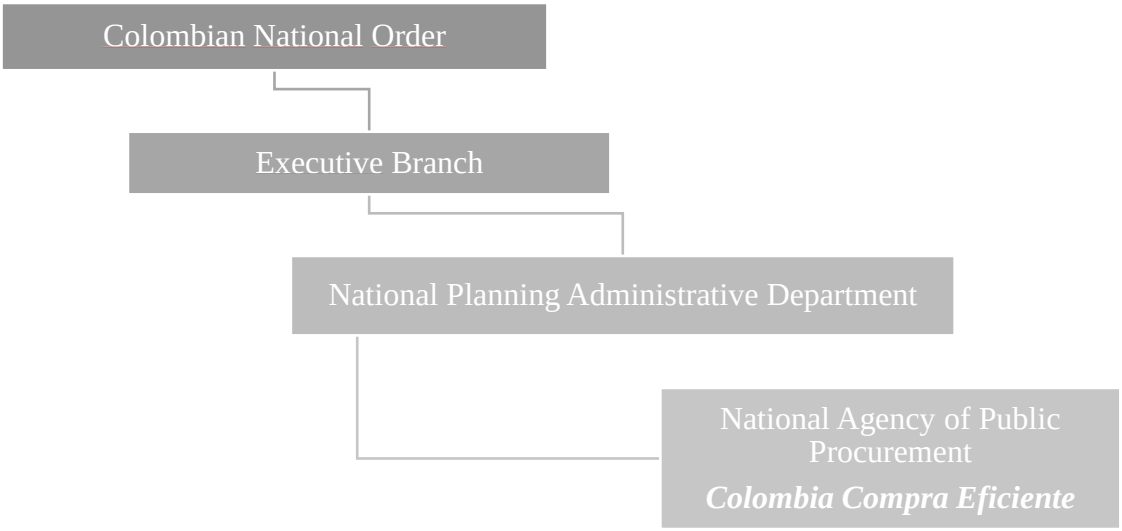
2.3.3. Colombia Compra Eficiente (Colombia Purchasing Efficiently)

Within the framework of the Good Government policy, in 2011, the National Government created the National Agency of Public Procurement *Colombia Compra Eficiente*, as a decentralized entity assigned to the National Planning Department to optimize public resources, improve competition, the efficiency and transparency of the Purchase System. The main purpose was to put information and communications technology at the service of the Public Procurement System to make contracts online. This in order to modernize the Purchase System, offer all interested parties the same information at the same time, present online offers, make transactions online, leaving records of who and when it makes decisions, decrease the use of paper and the displacements in the cities to present offers;

[9] Red Interamericana de Compras Gubernamentales (Inter-American Government Procurement Network) is a "Mechanism of the Inter-American System that provides high-level horizontal technical cooperation to generate and strengthen links among its members; promote the exchange of human, technical, financial and material resources for the generation of knowledge, experiences and good practices in public procurement in the countries of the Americas". Resolution AG / RES. 2894 (XLVI-O / 16) of the General Assembly of the OAS (June 2016)

that is, improve the efficiency, transparency, competence and quality of the information of the Public Purchase System.

Figure 2. *National Agency of Public Procurement within the Colombian National Order*



Source: self-made

The mission of *Colombia Compra Eficiente* is: (a) to offer the participants of the public purchase an information system that allows online transactions, with instruments and tools that respond to their needs and that offers sufficient and quality information to make decisions , and to fulfil the goals and objectives of the State Entities, the National Development Plan and the territorial development plans, generating value for money in the public purchase and trust in the System, promoting competition, transparency and ensuring access to information; (b) formulate public policies aimed at fulfilling the objectives of the Public Procurement System and offer tools for its management and make constant analysis of the current regulations and their application; (c) assist technically and work as a team with the participants of the public purchase; (d) support the development of the public procurement market, and monitor it; and (e) analyse, evaluate and monitor the behaviour of the Public Purchase System in search of innovation and continuous improvement of it. Its vision is to be the National Government organization that leads and coordinates the Public Purchase System of Colombia, generating value for money with

transparency in the public purchase in Colombia and trust in the system's participants. The entity defines the following elements as strategic objectives:

- Increase the value for money destined to the public purchase.
- Promote competition in public purchase.
- Offer an easy access e-Procurement system for the participants of the Public Purchase System that generates reliable information.
- Strengthen the capacities of the participants of the public purchase.
- Manage knowledge for the participants of the public purchase and for the work team of *Colombia Compra Eficiente*.
- Generate an environment of respect for the rules of the game and trust among the participants in the public purchase.

Colombia Compra Eficiente offers tools for online hiring in its capacity as administrator of the Electronic System for Public Procurement.

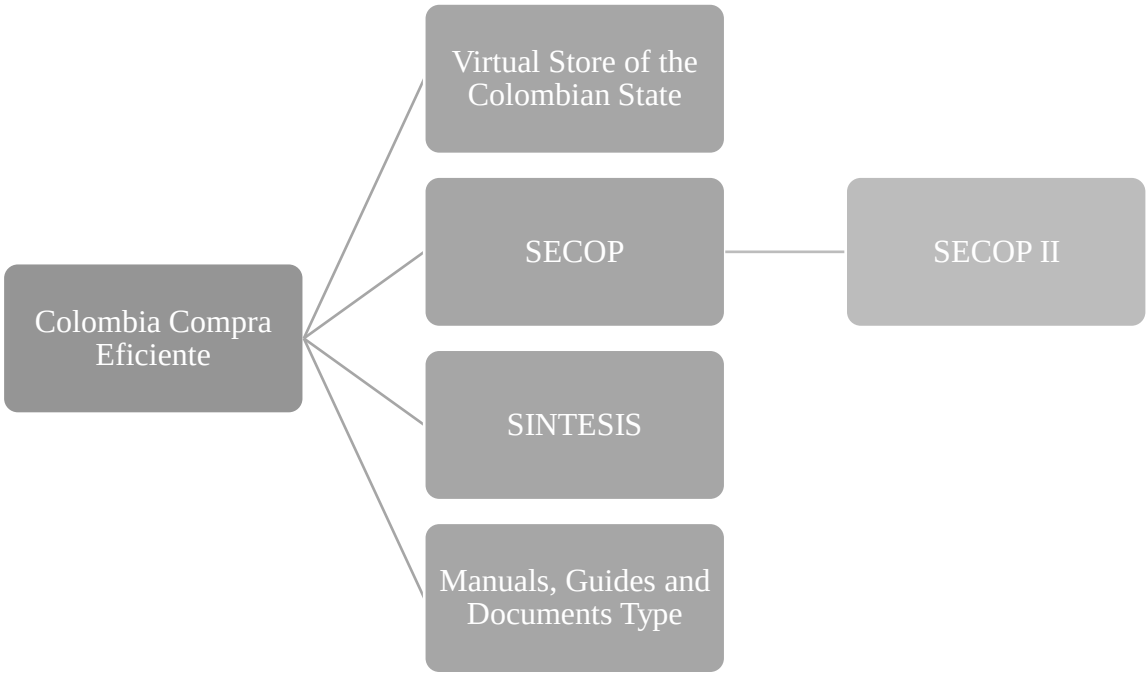
- ***Virtual Store of the Colombian State*** understood as an online tool that allows the State Entities to contract in the different aggregation instruments of demand that *Colombia Compra Eficiente* offers.
- ***SECOP***, a transactional system in which interested parties can make observations and proposers can present their offers online. This dynamic is understood as a way to institutionally review and organize the contractual activity of the State Entities.

- ***SINTESIS*** is an online tool with free and free access, which allows consulting the regulations and jurisprudence of the Public Purchase System.

- ***Manuals, Guides and Documents Type***, is a segment of the platform that offers manuals of procedures, guides and methodologies, available to all interested parties, to help the State Entities to elaborate the documents of the process, and specifications and standard contracts, promoting exemplary practices and providing the means for a correct procedure and documentation of the hiring process.

- ***SECOP II*** is the last version of SECOP (Electronic System of Public Procurement) that transits from an advertising platform to a transactional platform that allows Buyers and Suppliers to carry out the Online Contracting Process. From an own account, the State Entities (Buyers) can create and award Contracting Processes, register and follow up the contractual execution. Likewise, Suppliers have the option to open their own account, find business opportunities, follow up the Processes and send observations and Offers. The SECOP II allows all types of contracting, except for the purchase under Frame Agreements and other instruments of aggregation of demand, which is done through the Virtual Store of the Colombian State with a different username and password. The Process Documents become forms filled out by the Entity and where the necessary information is recorded to advance them.

Figure 3. *Online Services by Colombia Compra Eficiente*



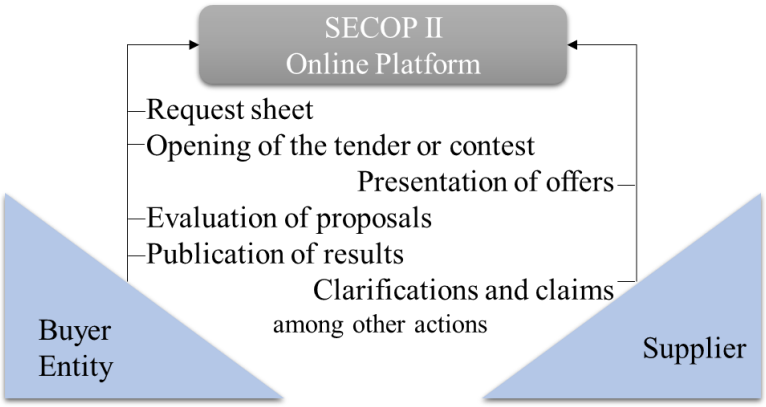
Source: self-made

2.3.4. SECOP II

Nowadays SECOP II is the only platform within which the online public contracting management in Colombia is carried out. The platform enters and registers entities of the

Colombian state as well as suppliers that wish to participate in the contracting processes offered. At the moment in which a certain entity, already registered, wishes to initiate a process of purchasing goods or services for a specific objective, it creates a module according to a specific type of contract (based on its particularities). Subsequently, the participating suppliers in the process, will enter the same through their participation in the module created by the entity. On the other hand, the same community can enter the online platform and observe each of the stages of the hiring processes, in order to guarantee the opportunity for citizen control.

Figure 4. *Basic Operation of SECOP II*



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2.3.5. Traceability

Traceability is a set of actions, measures and technical procedures that allow identifying and registering each product from its origin to the end of the production chain. The concept of traceability has been formulated from the areas of food processing, chemicals, and beauty among others, as well as from the area of software processing, and in the last decades in the areas of transportation and processing of goods and services.

Lindvall (1996, pp. 1169-1180) from a software processing approach, exposes traceability as a quality attribute that allows to validate and control the transformation of components within a process. Lindvall defined also this term as the ability to determine how part of a procedure affects other parts in turn. According to the International Organization for Standardization (ISO) , traceability is defined as “the attribute of the

result of a measure or the value related to specified references, usually national or international standards, through a production chain" (2012). On the other hand, the Committee on Food Safety of AECOC[10] defines it as "those pre-established and self-sufficient procedures that allow knowing the history, location and trajectory of a product or batch of products along the supply chain at a given moment" (2013).

The study of traceability as a tool of observation and monitoring of the development of a process has allowed to subdivide said trace in stages or also in sections of layout. In accordance with ISO standards (2012), when it comes to having to understand the traceability of a product that moves through its production chain, the concept of traceability is divided into three parts: i) ascending traceability (backward): where are monitored the products that are received in the organization, that is, the inputs to be transformed throughout the process, and who are the suppliers of those products; ii) internal traceability or traceability of internal processes, meaning traceability within the organization itself; iii) descending traceability (forward): where the products issued by the company are tracked, bounded with some traceability information and know their destinations and customers.

In the same way, the ISO regulates a series of aspects that are basically in the register of information where each agent involved in the process must have a computer system to be able to generate, manage and record the necessary traceability information at each moment and stage of process; the identification of inputs, products and associated characteristics that allows assigning variables to them and automating the capture of traceability data and their registration; and the transmission of the traceability information necessary to be used and applied by all the interested parties in the process.

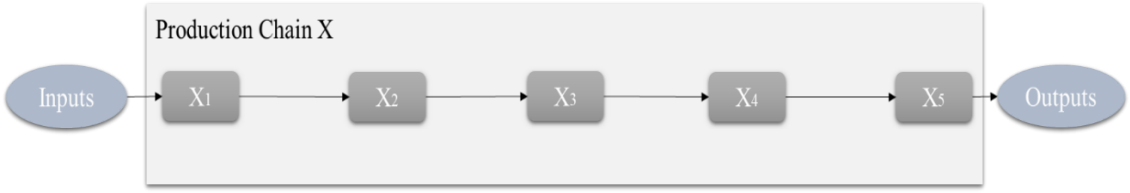
2.4. CONCEPTUALIZATION

For purposes of this analysis, it is based on the conception of an administrative process to which particular inputs enter to be transformed into outputs through a chain of

[10] The Committee on Food Safety pretends to optimize all the activities and the relations between the participants of the chain of supply to maximize the alimentary hygiene as well as the quality and his perception by part of the consumer.

production (Figure 5, Production Chain X) where certain procedures intervene (Figure 5, procedures X_1, X_n).

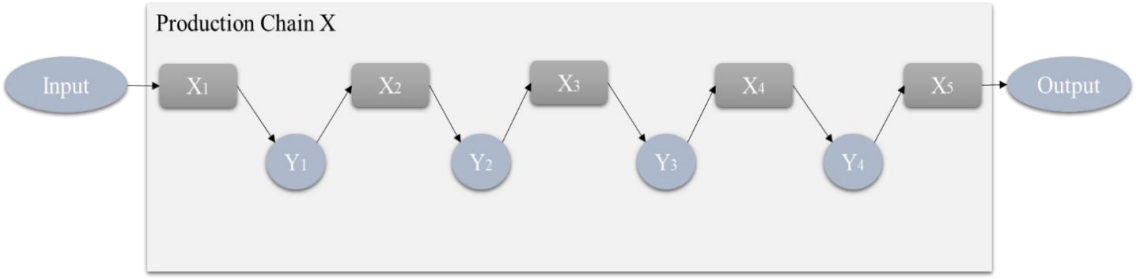
Figure 5. *Process X Flowchart*



Source: self-made

Within this ***process***, after the intervention of each procedure, subproducts and / or products prior to the final product are generated (Figure 6, subproducts Y_1, Y_n). Each of these subproducts are minutes, documents, regulations, administrative acts, publications, among others, which are outputs generated by each procedure and which in turn are inputs or inputs for the following procedure within the general process.

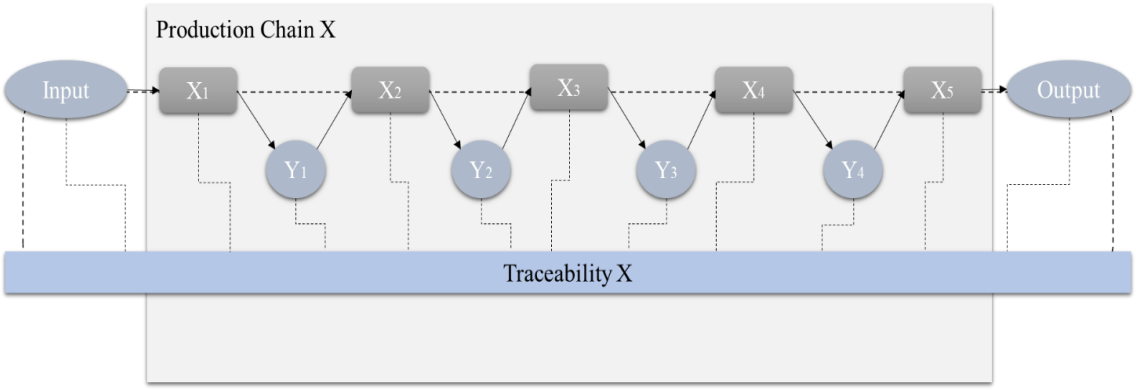
Figure 6. *Subproducts Between Procedures*



Source: self-made

In the framework of this analysis, the concept of ***traceability*** will be understood as the monitoring of this process and each of its parts; the interactions, operations and transactions between the procedures, the products and by products generated, and the type of relationships between their components are controlled and validated.

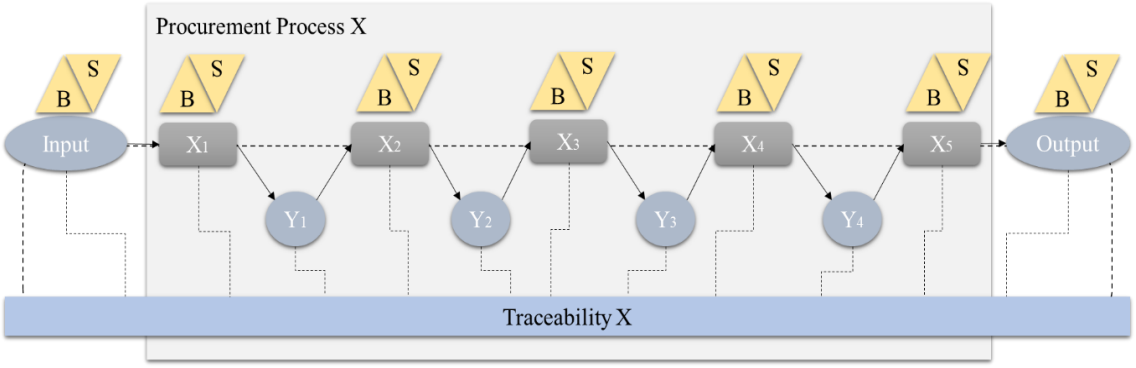
Figure 7. *Process Traceability*



Source: self-made

For the study of traceability within a process, this analysis is done for the present work within a public procurement process. The ***public procurement process*** is also a chain of production of administrative acts for the purpose of managing the purchase of goods or services by a particular public entity from certain suppliers of the private or public sector as well.

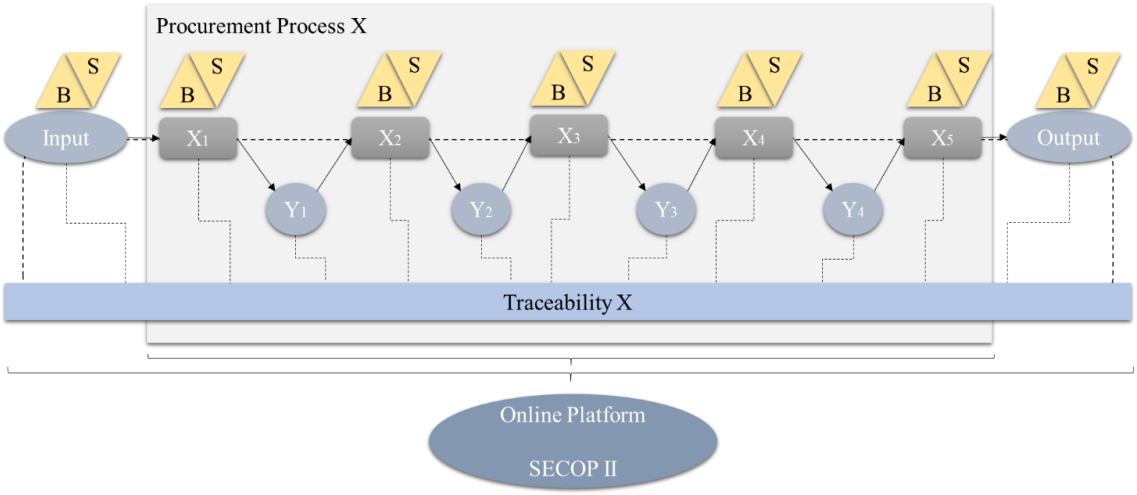
Figure 8. *Traceability in Public Procurement Process*



Source: self-made

This process of public procurement, in addition, is a process that has been carried out on an *online platform*, which has been called SECOP II (***Electronic System of Public Procurement***). This web platform has been developed on the conception that it is a system that tends to a high level of transparency and traceability, since being on an internet platform open to the public, reduces the risks associated with the visibility skirt, tracking and control of contracting processes.

Figure 9. *Traceability in Online Public Procurement Process (SECOP II system)*



Source: self-made

The concept of traceability in the analysis of online public procurement processes, for this study, will focus on the observation, operation, interaction and transaction components between the purchasing entities and the suppliers, both active and relevant participants in the public procurement process online. These factors make up the different modes of relationship in each of the parts of the process and can decant information about the different levels of participation, and relevance to the interior of the process.

3. CHAPTER III: METHODOLOGY

To explore the traceability concept within the online public procurement processes in Colombia and the relation of purchasing entities and suppliers in it, a content analysis format is proposed. This chapter covers three points in which the content of analysis is exposed as a methodological axis, the contents to be analysed and the proposed methodology for such analysis in the present paper to study the concept of traceability and the existing relationships within the online public contracting process in Colombia.

3.1. CONTENT ANALYSIS

Content analysis is based on textual and visual reading as an instrument for collecting information, reading that is carried out following the systematic, objective and replicable method. In that sense, it is similar in its problematic and methodology, except for some specific characteristics, to that of any other technique for gathering social research data (Abela, 2015). However, the characteristic of content analysis and that distinguishes it from other techniques of sociological research, is that it is a technique that intrinsically combines, and hence its complexity, the observation and production of data, and the interpretation of these.

All content of a text can be interpreted in a direct and manifest way; therefore, you can perceive from a text or an image the manifest or direct content that is representation and expression of the meaning for which a certain text has been written. This content analysis can be quantitative and qualitative. For the present analysis it is necessary to make an observation of qualitative nature. The main components of the qualitative content analysis are based on different forms of interpretation of the texts.

3.2. CONTENTS TO ANALYSE

The texts to be used for the present analysis are official documents made by the entity for online procurement in Colombia, *Colombia Compra Eficiente*. The entity counts on a

department for the planning and control within which the procedure and operation manuals are formulated. Specifically, the documents to be analysed are:

Table 1. *Contents to Analyse*

No.	Title	Code	Validity	Version
1	*Colombia Compra Eficiente* Hiring Manual *Manual de Contratación de Colombia Compra Eficiente*	GC-MN-01	31/03/2016	1th
	https://www.colombiacompra.gov.co/sites/cce_public/files/cce_documentos/20160831manualdecontratacion.pdf			
2	*Colombia Compra Eficiente* Procedures Manual *Manual de Procedimientos de Colombia Compra Eficiente*	GC-MNP-01	01/04/2016	1th
	https://www.colombiacompra.gov.co/sites/cce_public/files/normativas/20131025_manual_de_procedimientos_colombia_compra_eficiente.pdf			
3	Public Biding Selection Modality Procedures Manual *Manual de Procedimientos para la Modalidad de Selección Licitación Pública*	M-MSLP-02	27/04/2017	2th
	https://www.colombiacompra.gov.co/sites/cce_public/files/cce_documents/cce_manual_licitacion_publica.pdf			
4	Minimum Amount Selection Modality Procedures Manual *Manual de Procedimientos para la Modalidad de Selección Mínima Cuantía*	M-MSMC-02	20/04/2017	2th
	https://www.colombiacompra.gov.co/sites/cce_public/files/cce_documents/cce_manual_minima_cuantia.pdf			
5	Direct Contracting Selection Modality Procedures Manual *Manual de Procedimientos para la Modalidad de Selección Contratación Directa*	M-MSCD-02	20/04/2017	2th
	https://www.colombiacompra.gov.co/sites/cce_public/files/cce_documents/cce_manual_contratacion_directa.pdf			

6	Merit Contest Selection Modality Procedures Manual *Manual de Procedimientos para la Modalidad de Selección Concurso de Méritos*	M-MSCM-02	27/04/2017	2th
	https://www.colombiacompra.gov.co/sites/cce_public/files/cce_documents/cce_manual_concurso_meritos.pdf			
7	Abbreviated Selection Modality Procedures Manual *Manual de Procedimientos para la Modalidad de Selección Abreviada*	M-MSSA-02	27/04/2017	2th
	https://www.colombiacompra.gov.co/sites/cce_public/files/cce_documents/cce_manual_seleccion_abreviada.pdf			

Source: self-made / The listed documents are granted by the entity in Colombia, each one is in the link next to it.

These documents are published on the website of the entity *Colombia Compra Eficiente* www.colombiacompra.gov.co.

3.3. METHOD

For the content of analysis of the mentioned documents, a theoretical method of modelling is proposed, based on process and procedure mapping, which concludes in a flow analysis model. This model analyses the processes and procedures described in the documents generated by the entity *Colombia Compra Eficiente* for online public procurement in Colombia.

3.3.1. Process Mapping

Process mapping as a method is an interactive tool that allows to understand and analyse the relationship of processes described in the documents and their components from multiple perspectives. The technique allows the processes written in the texts to be identified quickly and easily and modelled by cascading down from the medullary level to the desired level. The model consists in knowing in detail each one of the processes within the documents, defining for each one its inputs and outputs (inputs and products),

users and suppliers, those responsible of the execution, the work programs and the points of control, of supervision (direction), measurement to realize problems and to propose improvement actions.

For the mapping, each of the elements with which users and suppliers interact should be considered clearly and concisely classify their respective activities and procedures for the use and administration of inputs and outputs. It is essential the punctual classification of users and suppliers for the subsequent relational analysis of them. For the first analysis, three maps will be plotted. For the present methodology of process mapping, it will consider the realization of three different mapping or charting models for the definition and analysis of the elements that make up the online public procurement process. These are Process Characterization Map (PCM), Procedures Flowchart (PF), and Rate Intervention Analysis (RIA).

a. Process Characterization Map (PCM)

The first, Process Characterization Map (PCM) is a matrix for identifying the process described in the documents where its name, responsible, objective and scope are related, to then outline what are the procedures within the process; for each one of the component procedures of the process, the responsible parties, entrances, exits, and their corresponding suppliers and acquirers must also be identified.

The goal of the process characterization map is to show which are the elements that make up a certain process, considering this as a series of activities carried out to achieve the transformation of a product or several products. It is also important to note that these processes are framed in an administrative context in the public sector, which implies understanding the importance of characterizing a missionary process within a public entity. For this characterization, constituent elements of the process are defined within a matrix:

1. Process name
2. Process owner
3. Goal of the process

4. Scope of the process
5. Policy of operation
6. Internal provider
7. External provider
8. Inputs
9. PDCA (cycle plan, do, check and act)
10. Activity
11. Responsible
12. Outputs
13. Internal recipient
14. External recipient

This matrix defines in its first boxes the items related to the general information of the characterization of the contractual management process. Then in the subsequent rows, will show the activities related with the process. For each of the activities, both internal and external suppliers are considered, who feed certain documents (understood as inputs) to the agencies responsible for the process. These in turn generate outputs that are of interest and of use by beneficiaries or customers internal and external to the entity. Each of the activities are classified (item number 9 PDCA-Deming Cycle), according to the type of activity they are in the process. These are planning, doing, checking and acting activities[11].

Table 2. *Process Characterization Map (PCM) Sample*

1. Process Name (1.1)	
2. Process owner	2.1
3. Goal of the process	3.1
4. Scope of the process	4.1
5. Policy of operation	5.1
Components	

[11] Strategy of continuous improvement of quality in four steps, based on a concept devised by Walter A. Shewhart. It is widely used by quality management systems (QMS) and information security management systems (ISMS).

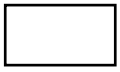
No.	*6. Internal provider*	*7. External provider*	*8. Inputs*	*9. PDCA*	*10. Activity*	*11. Responsible*	*12. Outputs*	*13. Internal recipient*	*14. External recipient*
1	6.1	7.1	8.1	P, D, C or A	10.1	11.1	12.1	13.1	14.1
n	6.n	7.n	8.n	P, D, C or A	10.n	11.n	12.n	13.n	14.n

Source: self-made

b. Procedures Flowchart (PF)

The Procedures Flowchart (PF) represents the sequence of the step-by-step procedures described in the documents in its different activities, through the chronological chaining, by means of a classification with symbols, lines and specific words. The Procedures Flowchart also considers the preparation of a diagram with the respective flowchart of operations in relation to the areas and / or processes responsible for said operations. Linear diagramming is integrated with a basic matrix in order to locate the icons of the flow diagram in the columns corresponding to each person in charge. The icons that are used to diagram this flow are:

Table 3. *Flowcharts Icons*

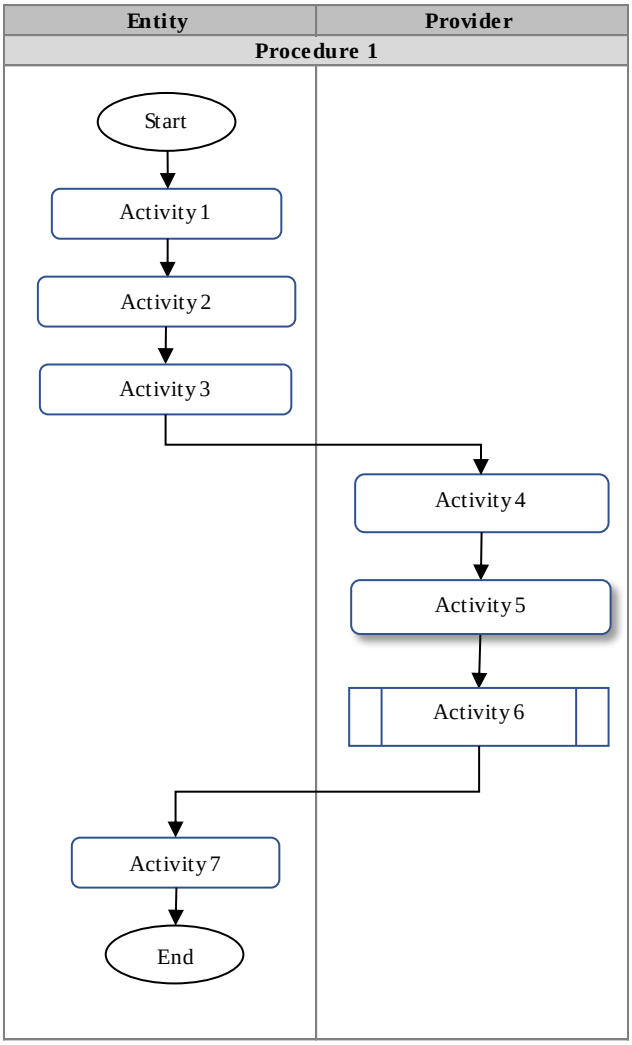
Symbol	*Denomination*	*Description*
	Terminal start or end	Indicates initiation or termination of the flowchart.
	Activity	Indicates the completion or execution of an activity.
	Direction of flow	Connect the symbols indicating the order in which the different activities must be executed, defining in this way the sequence of the procedure.
	Page connector	Indicates the continuity of the activities on the next page, the same number is placed at the end of the page and at the beginning of the next one.

	Check Point	Indicates that the activity is a review or verification of compliance with requirements, necessary for the development of the objective of the procedure.
	Report / Registration	Indicates the record that is generated when the activity is developed.
	Feedback Activity	Indicates an activity where the parties involved in the procedure dialogue.

Source: self-made

A flowchart will be made for each contracting modality, according to its characteristics previously defined in the base analysis documents for this methodology. Each flowchart counts with the naming of its procedures, within which two columns are assigned to relate the respective activities. For example, for the realization of the flowcharts suppose in the following model to exemplify the use of the icons. A *procedure 1* is assumed that has 7 activities. For the flowcharts within this work, a division will be made to expose the activities carried out by the purchasing entities and the suppliers. In the following model it is possible to see that the procedure starts with an activity carried out by the entity followed by two other equals. Then the fourth activity to be executed by the provider is located in the column on the right, where two other activities, one of record type and one of feedback continue. Finally, the entity executes a final activity, which is again recorded in its respective column.

Figure 10. *Flowchart Sample*



Source: self-made

The activities described within the flowcharts are the basis for the formulation of the RIA, where each activity is displayed in their respective tasks. Each flowchart is formulated based on the specificities of each of the contracting modalities described in the base analysis documents.

c. Rate Intervention Analysis (RIA)

The Rate Intervention (RIA) consists of an analysis that starts from PCM and PF where the operational, decision and control activities must be recorded, but this time the information from PF will be taken to specify in which cases each of these activities is

carried out by an internal actor (buyers) and an external actor (providers). Scaled from the process characterized in PCM to scale it in the procedures inside it and finally record the operations attached to this procedure. For this analysis, it starts with a record of the procedures, activities and tasks in their respective order of execution. These tasks are located within the table according to whether they are executed by the entities or suppliers, therefore, the attached numbering is independent starting from 1 to the total number of tasks for each of the two columns (left entity, right supplier). At the centre of these two columns is the Impact level in the contracting process management, which will allow the analysis of traceability within the process. Within this central column values from 1 to 5 are recorded, according to the type of activity registered in the corresponding column. These activities will be valued according to the type of action they denote. This in order to be able to do the traceability analysis within the process. This categorization of activities arises from the concept of traceability from monitoring, control, and transaction within the procedure. These forms of action denote the level of impact within the process, which in turn shows different ways of being part and acting within the process. The actions are classified according to the way in which the actions carried out by entities or suppliers affected the parties in the process or the same process. These forms of action are:

- *Observation*. It considers all types of actions that involve exclusively information search, observation of contents, observations of publications, recognition of the SECOP II electronic system website areas for online contracting in Colombia.
- *Mobility in the system*. It considers all types of actions that exclusively involve access and mobility between areas of the SECOP II electronic system website for online contracting in Colombia.
- *Dialog between parts*. It considers all types of actions that exclusively involve communication between the entity and the suppliers, either through a forum or consultations in the process within the SECOP II electronic system website for online contracting in Colombia.
- *Transactionality of content*. It considers all types of actions that exclusively involve loading and unloading content of material and information that makes up each of the contracting processes within the SECOP II electronic system for online contracting in Colombia.

- *Direct affection / Decision making*. It considers all types of actions that involve exclusively making decisions or actions that significantly affect the course of the contracting processes within the SECOP II electronic system for online contracting in Colombia.

Each of these forms of actions get a score to quantify the level of total affection that these actions would have within the process. The scores values were:

- *Observation*. 1
- *Mobility in the system*. 2
- *Dialog between parts*. 3
- *Transactionality of content*. 4
- *Direct affection / Decision making*. 5

These values will be assigned according to the verb that defines each action. It is the verb that characterizes the type and level of impact that will be assigned to the forms of action. According to the definition previously done of the forms of action, is made a categorization of the terms and verbs that are used within the processes. Based on the analysis of the lexical polysemy of Muñoz (1999, p. 61), we grouped the verbs found considering their relations of content or synonymy. in this way the verbs related to the forms of action will be the following:

- *Observation*: To consult, to check, to see.
- *Mobility in the system*: To access, to confirm, to download, to enable, to find, to modify, to prepare, to select, to verify.
- *Dialog between parts*: To answer, to ask, to submit, to validate, to respond.
- *Transactionality of content*: To attach, to diligence, to edit, to fill, to include, to upload.
- *Direct affection / Decision making*: To approve, to create, to publish.

Each task must obtain a single score according to the type of action by the entity or provider. These are used later to obtain the absolute and relative values of the RIA.

Table 4. *Rate Intervention Analysis (RIA) Sample*

		Impact level in the contracting process management						
No.	***Activities by the Entity***	1	2	3	4	5	***Activities by the Provider***	No.
	Procedure 1						—	
	Activity 1.1						—	
1	Task 1.1.1		2				—	
	Activity 1.2						—	
2	Task 1.2.1					5	—	
	—						**Activity 1.3**	
	—		2				Task 1.3.1	1
	—						**Activity 1.4**	
	—			3			Task 1.4.1	2

Source: self-made

Table 5. *Formulas for Results RIA*

	Variable	**Formula**					
T	Total tasks number	ET+PT					
ET	Entity's tasks number	Σ E					
Ep	Entity's intervention percentage	(ET/T)*100					
PT	Provider's tasks number	Σ P					
Pp	Provider's intervention percentage	(PT/T)*100					
		1	2	3	4	5	f-u
Til	Total number of tasks by impact level	Eil+Pil (1)	Eil+Pil (2)	Eil+Pil (3)	Eil+Pil (4)	Eil+Pil (5)	T

Eil	Entity's number of tasks by impact level	Σ Eil (1)	Σ Eil (2)	Σ Eil (3)	Σ Eil (4)	Σ Eil (5)	T
Pil	Provider's number of tasks by impact level	Σ Pil (1)	Σ Pil (2)	Σ Pil (3)	Σ Pil (4)	Σ Pil (5)	T-Pt
Eilr	Entity's impact level relation	(Eil/Til)*1	(Eil/Til)*2	(Eil/Til)*3	(Eil/Til)*4	(Eil/Til)*5	(Eil/Til)*6
Pilr	Provider's impact level relation	(Pil/Til)*1	(Pil/Til)*2	(Pil/Til)*3	(Pil/Til)*4	(Pil/Til)*5	(Pil/Til)*6

Source: self-made

To obtain the values, it starts from the sum of tasks for both entities and suppliers. These values are considered for the total sum of tasks, and for the relative value of the total of activities executed by entities and suppliers respectively. Subsequently there is the total of activities carried out by entities and suppliers, but according to the types of action their valuation in the general table between 1 and 5. As shown in the previous table, these values are also added to find the total of activities for each level of action within the process. Finally, for the relationship level of impact within the process, the number of activities for entities and suppliers divided by the level of tasks in that level is taken by each action level and multiplied by the nominative value of the level.

After the respective weighting, summation and getting percentages of these values, the results obtained define in each of the contracting modalities in Colombia Total tasks number, Entity's tasks number, Entity's intervention percentage, Provider's tasks number, Provider's intervention percentage, Total number of tasks by impact level, Entity's number of tasks by impact level, Provider's number of tasks by impact level, Entity's impact level relation, and Provider's impact level relation. At the end of the total summation and after the relative values have been found, a value called *f-u* (follow-up) is also placed, which corresponds to the general observation that each actor can potentially

make within the process. This number corresponds to the total number of tasks within the process. To relativize its value according to the level of action of the actors, this value will be the sum of the 5 relative values obtained at the end of the processing.

The process mapping method allows discovering inputs, relationships or products, which are included in the analysis of the rate of intervention. The analysis is carried out at different levels of the processes, with which different approaches are obtained to achieve a sufficient and satisfactory level of detail. The processes are fed with inputs, which transformed into products satisfy the needs of both internal and external users and customers; in this case transformed or facilitated by internal and external suppliers. The analysis to achieve the best of the processes is achieved through the recognition of disconnection points, that is, inputs or outputs without a destination, or processes that require non-explicit inputs, necessary to achieve the expected products. This requires a process of continuous review and reflection, which allows detecting and avoiding duplications and making unnecessary efforts. This analysis is also used to support the implementation and operation of quality management and certification systems.

4. CHAPTER IV: MAPPING AND INFORMATION PROCESSING

In this chapter the proposed methodology is developed, inserting the documents and proposed information within the matrices to be analysed. Inside this, are the Process Characterization Map, the Procedures Flowcharts and the Rate Intervention Analysis, within which the information is run and processed, and the after be able to make the respective observations and the level of traceability of each of the actors within the hiring processes proposed.

4.1. PROCESS CHARACTERIZATION MAP (PCM)

In the Process Characterization Map, all the information corresponding to the process is recorded according to certain items that define its components. This information is taken from the definition of the contractual management process of the *Colombia Compra Eficiente* entity (CCE, 2017).

The purpose of the process characterization map is to show which are the elements that make up a certain process, considering this as a series of activities carried out to achieve the transformation of a product or several products. It is also important to note that these processes are framed in an administrative context in the public sector, which implies understanding the importance of characterizing a missionary process within a public entity. This process is also linked to a process matrix, both support and mission, which frame the road map for the development and achievement of the functions for the fulfilment of the objective of the entity *Colombia Compra Eficiente*.

For this characterization, constituent elements of the process are defined within a matrix:

1. Process name
2. Process owner
3. Goal of the process
4. Scope of the process
5. Policy of operation

6. Internal provider
7. External provider
8. Inputs
9. PDCA (cycle plan, do, check and act)
10. Activity
11. Responsible
12. Outputs
13. Internal recipient
14. External recipient

The process characterized below is the process of contractual management of the entity *Colombia Compra Eficiente*. It is a support process that aims to manage all the activities and strategies for guarantee the highest value for money, legality and transparency of the procurement processes of the goods, works and services required by *Colombia Compra Eficiente* for the fulfilment of its functions. The original source document of the information to be entered in the matrix is an official document published by the entity for the service of citizenship. This document is carried out by the same entity based on process manuals for documentation within the framework of technical standards of quality in public management.

This matrix defines in its first boxes the items related to the general information of the characterization of the contractual management process. Then in the subsequent rows, 12 activities are related that are segregated in the other constitutive items of the process. For each of the activities, both internal and external suppliers are considered, who feed certain documents (understood as inputs) to the agencies responsible for the process. These in turn generate outputs that are of interest and of use by beneficiaries or customers internal and external to the entity. Each of the activities are classified (item number 9 PDCA-Deming Cycle), according to the type of activity they are in the process. These are planning, doing, checking and acting activities[12].

[12] Strategy of continuous improvement of quality in four steps, based on a concept devised by Walter A. Shewhart. It is widely used by quality management systems (QMS) and information security management systems (ISMS).

Table 6. *Contractual Management Process Characterization Map*

1. CONTRACTUAL MANAGEMENT PROCESS									
2. Process owner			Secretary General of the National Agency of Public Procurement						
3. Goal of the process			Guarantee the highest value for money, legality and transparency of the procurement processes of the goods, works and services required by Colombia Compra Eficiente for the fulfilment of its functions.						
4. Scope of the process			It begins with the formulation of policies and the planning of contract management, and ends with the preparation and execution of improvement plans, corrective, preventive actions and improvement of the process.						
5. Policy of operation			E-procurement strategy formulated by Colombia Compra Eficiente						
Components									
No	**6. Internal provider**	**7. External provider**	**8. Inputs**	**9. PD CA**	**10. Activity**	**11. Responsable**	**12. Outputs**	**13. Internal recipient**	**14. External recipient**
1	Strategic addressing process	External regulators	Regulatory framework	P	Formulate policies and plan contractual management	Director General secretary	Operational policies Operational policies Action plan for contract management	Contractual management process	Control entities Citizen control
2	Process leader	Organism / Multilateral Banking	Operational policies Action plan for contract management Banking / Multilateral Organization contracting policies	P	Socialize the policy and action plan of contract management	General secretary	Operational policies and action plan for socialized contract management	All processes	Does not apply

3	Process leader Contractual management process Financial management process Strategic addressing process Internal regulator	External regulators Organism / Multilateral Banking	Regulatory framework Policies and plans Historical reports on the execution of the budget, the existence of goods and services Necessities by dependency Investment projects disaggregated at activity level	P	Prepare, consolidate and approve the Annual Procurement Plan	Director General secretary Technical Assistant Directors Analyst / Contractor Acquisition Specialist Banking / Multilateral Organization	Annual procurement plan approved and published	All processes	Participants in contractual management Control entities Citizen control
4	Financial management process	External regulators	Regulatory framework Annual Budget Law Approvedannual procurement plan	P	Approve the Annual Procurement Plan	General secretary Analyst / Contractor Technical Acquisition Specialist Banking / Multilateral Organization	Annual adjusted procurement plan approved and published	All processes	Participants in contractual management Control entities Citizen control

5	Contractual management process	Organism / Multilateral Banking	Annual procurement plan Manual to determine and verify the qualifying requirements in the Procurement Processes Manual for the identification and coverage of risk Guide for the Development of Sector Studies Guide to guarantees in Contracting Processes Manuals and guides Organism / Multilateral Banking	D	Plan contractual management	Director General secretary Technical Assistant Directors Analyst / Contractor Acquisition Specialist Banking / Multilateral Organization	Sector and market studies Previous studies Contract specifications Terms of the contract Budget Availability Certificate and / or future validity Technical viability	Contractual management process Financial management process	Suppliers of goods, works and services Participants in contractual management Control entities Citizen control
6	Spending computer Contractual management process Financial management process Strategic addressing process	Suppliers of goods, works and services Organism / Multilateral Banking	Sector and market studies Previous studies Contract specifications Terms of the contract Technical viability	D	Select the contractor or issue a declaration of desert	Contract Managing Director Analyst / Contractor Contracts Supervisor Hiring Officer Banking / Multilateral Organization	Opening act proposals Enabling and evaluation studies Act of adjudication or declaration of desert Publication of selection documents	Contractual management process Framework agreements process Supervisor	Bidders Participants in contractual management Control entities Citizen control

7	Spending computer Contractual management process		Award act	D	Hire the selected natural or legal persons	Contract Managing Director Analyst / Contractor Contracts Supervisor Hiring Officer Banking / Multilateral Organization	Subscribed contract Approved warranties Budget recordInitial act Publication of contracting documents	Contractual management process Framework agreements process Financial management process Supervisor	Contractor Control entities Citizen control
8	Contractual management process Financial management process Supervisor	Contractors Controller	Subscribed contract Approved guarantees Budget record	D	Execute the object of the contract under the agreed conditions	Contract Managing Director Analyst / Contractor Contracts Supervisor Hiring Officer Banking / Multilateral Organization	Processing of payment of obligations Publication of execution documents	Contractual management process Financial management process Supervisor	Contractor Interventor Participants in contractual management Control entities Citizen control
9	Supervisor Contractual management process Financial management process	ContractorsController SECOP	Payment report obligations Supervisor / Auditor / Contractor reports Draft settlement act (when applicable)	C	Make contract closure	Contract Managing Director Analyst / Contractor Contracts Supervisor Hiring Officer Banking / Multilateral Organization	Act of liquidation Publication of closing documents	Contractual management process Financial management process	Contractor Supervisor and / or auditor Participants in contractual management Control entities Citizen control

10	Contractual management process	SECOP Organism / Multilateral Banking	Electronic information	C	Execute the information security process	Contract Managing Director Analyst / Contractor Contracts Supervisor Hiring Officer Banking / Multilateral Organization	Information secured	Contractual management process	Does not apply
11	Contractual management process	SECOP Organism / Multilateral Banking	Documentation associated with the process	C	Execute the filing process	Contract Managing Director Analyst / Contractor Contracts Supervisor Hiring Officer Banking / Multilateral Organization	Electronic and / or physical documents organized, classified and properly preserved	Contractual management process	Does not apply
12	Internal regulator	External regulators	Conceptual and legal framework for the formulation of the improvement plan and management evaluation reports	A	Prepare and execute improvement plans, corrective, preventive and process improvement actions	Contract Managing Director Analyst / Contractor Contracts Supervisor Hiring Officer Banking / Multilateral Organization	Execution and closure of preventive, corrective and process improvement actions	Contractual management process	Regulators, controllers and interest groups

4.2. PROCEDURES FLOWCHARTS (PFS)

The Procedures Flowchart (PF) represents the sequence of the step-by-step procedures described in the documents in its different activities, through the chronological chaining. The following Procedures Flowcharts consider the preparation of a diagram with the respective flowchart of operations in relation to the areas and / or processes responsible for said operations. Down is presented flowcharts for each contracting modality, according to its characteristics previously defined in the base analysis documents for this methodology. Each flowchart counts with the naming of its procedures, within which two columns are assigned to relate the respective activities for entities and providers.

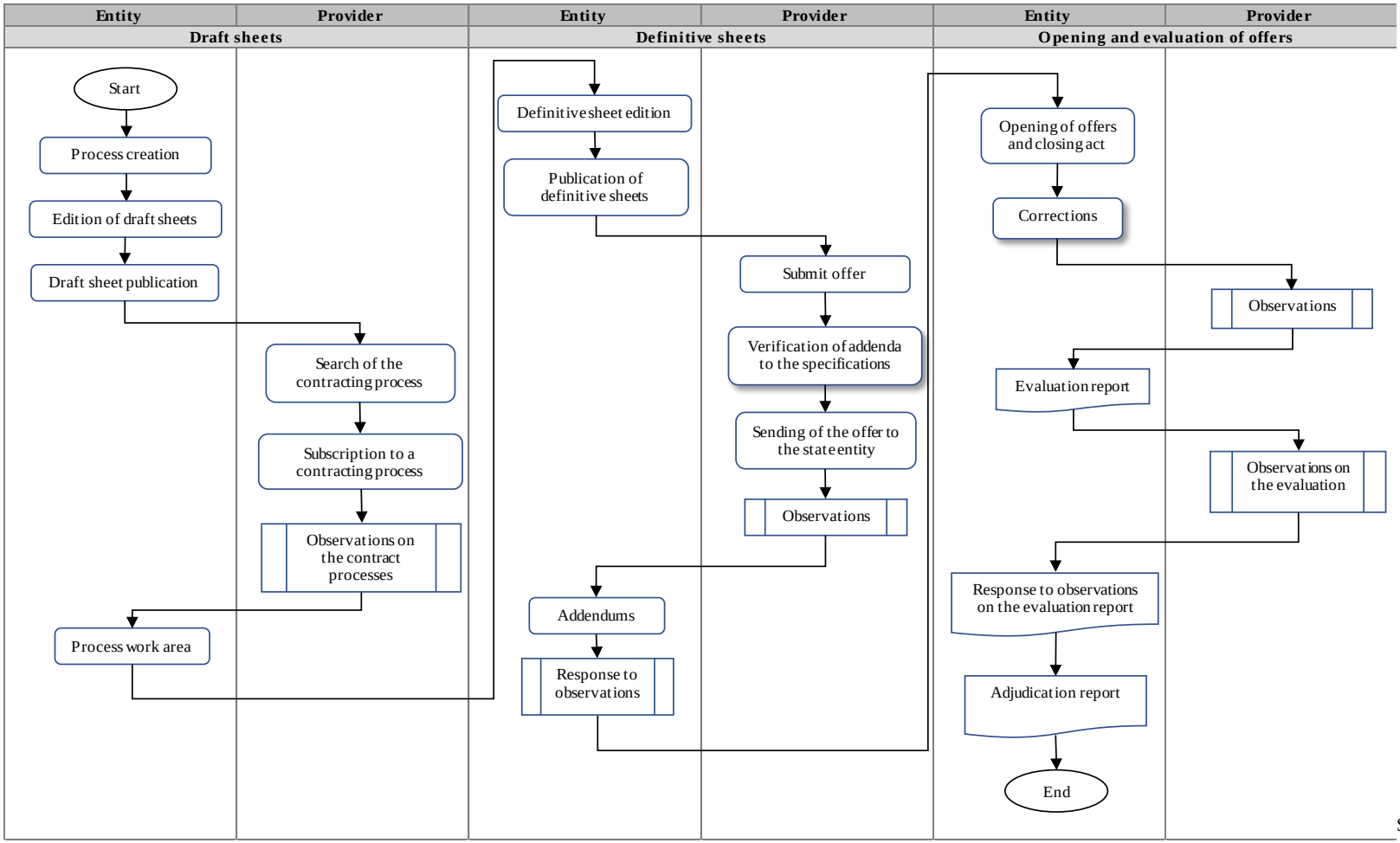
For Public Biding, three columns were diagrammed, that is, three procedures. In the first procedure, four activities are observed by the entity and three by the provider. In the second procedure, four activities are observed by the entity and four by the provider. In the third procedure, five activities are observed by the entity and two by the provider. For Minimum Amount, two columns were diagrammed, that is, two procedures. In the first procedure, four activities are observed by the entity and seven by the provider. In the second procedure, five activities are observed by the entity and two by the provider. For Direct Contracting, two columns were diagrammed, that is, two procedures. In the first procedure, five activities are observed by the entity and seven by the supplier. In the second procedure, only two activities are observed by the entity. For Merit Contest, three columns were diagrammed, that is, three procedures. In the first procedure, four activities are observed by the entity and three by the provider. In the second procedure, three activities are observed by the entity and four by the provider. In the third procedure, seven activities are observed by the entity and two by the supplier. For Abbreviated Selection, four columns were diagrammed, that is, four procedures. In the first procedure, four activities are observed by the entity and three by the provider. In the second procedure, four activities are observed by the entity and four by the provider. In the third procedure, only three activities are observed by the entity. In the fourth procedure, five activities are observed by the entity and two by the provider.

In said flowchart it is possible to demonstrate operational, control, and record activities. These activities will subsequently be classified as forms of action by the entities and suppliers, in order to later be able to perform the RIA analysis. The information used to record these operations within the flowcharts is all included in the texts and documents of objective analysis of study for this research, as described respectively in the methodology.

For each one of the contracting modalities, a flow chart is drawn up that sets out each one of the procedures and their respective actions, which will be detailed later in the RIA. These flowcharts show the way in which the process for each of the modalities varies according to the needs and particularities of each modality. It also reflects, as the flow of actions transits in the hands of entities and suppliers, clearly showing the responsibilities of each of these within the process.

a. Public Biding

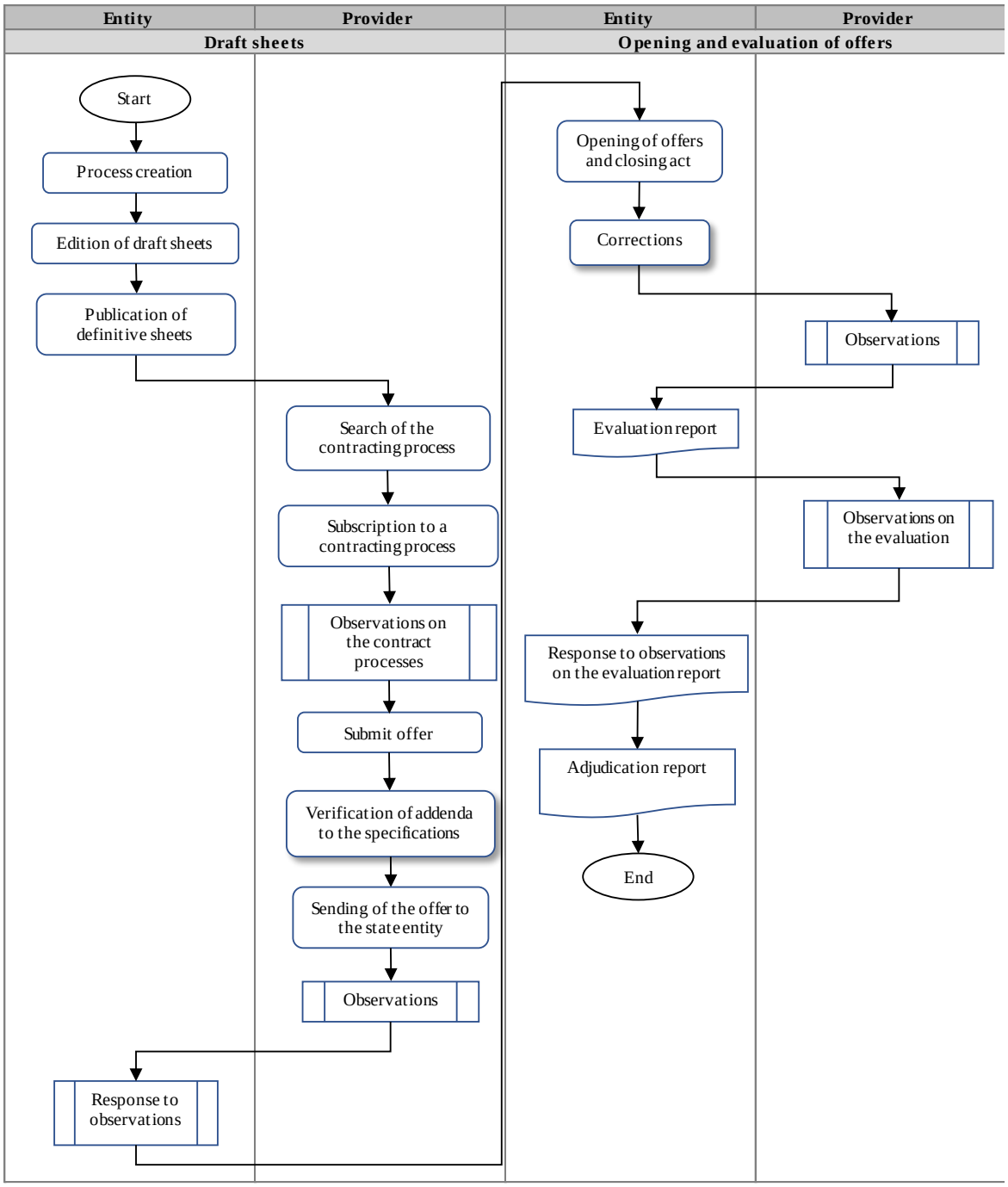
Figure 11. *Public Biding Flowchart*



Source: self-made

b. Minimum Amount

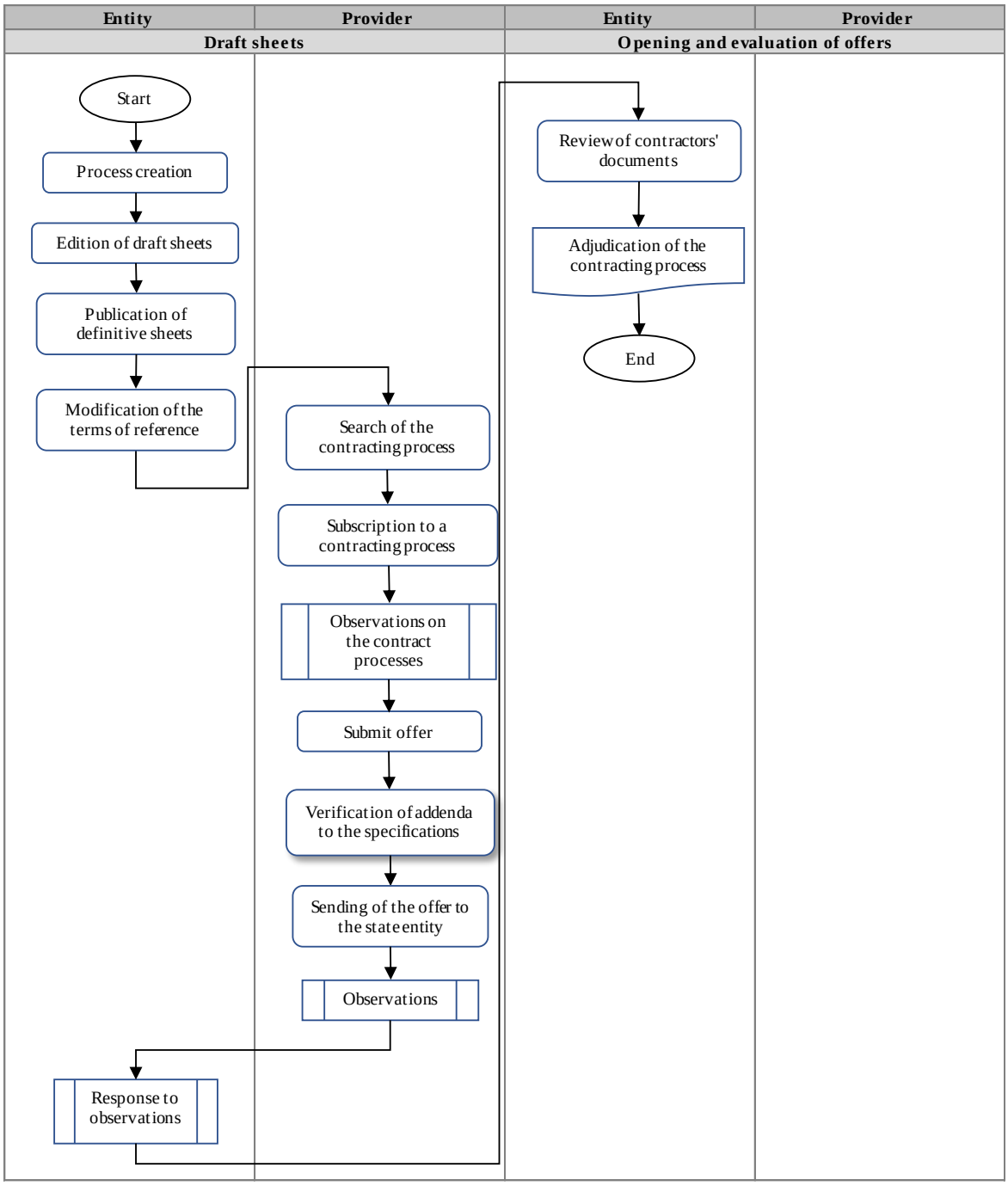
Figure 12. *Minimum Amount Flowchart*



Source: self-made

c. Direct Contracting

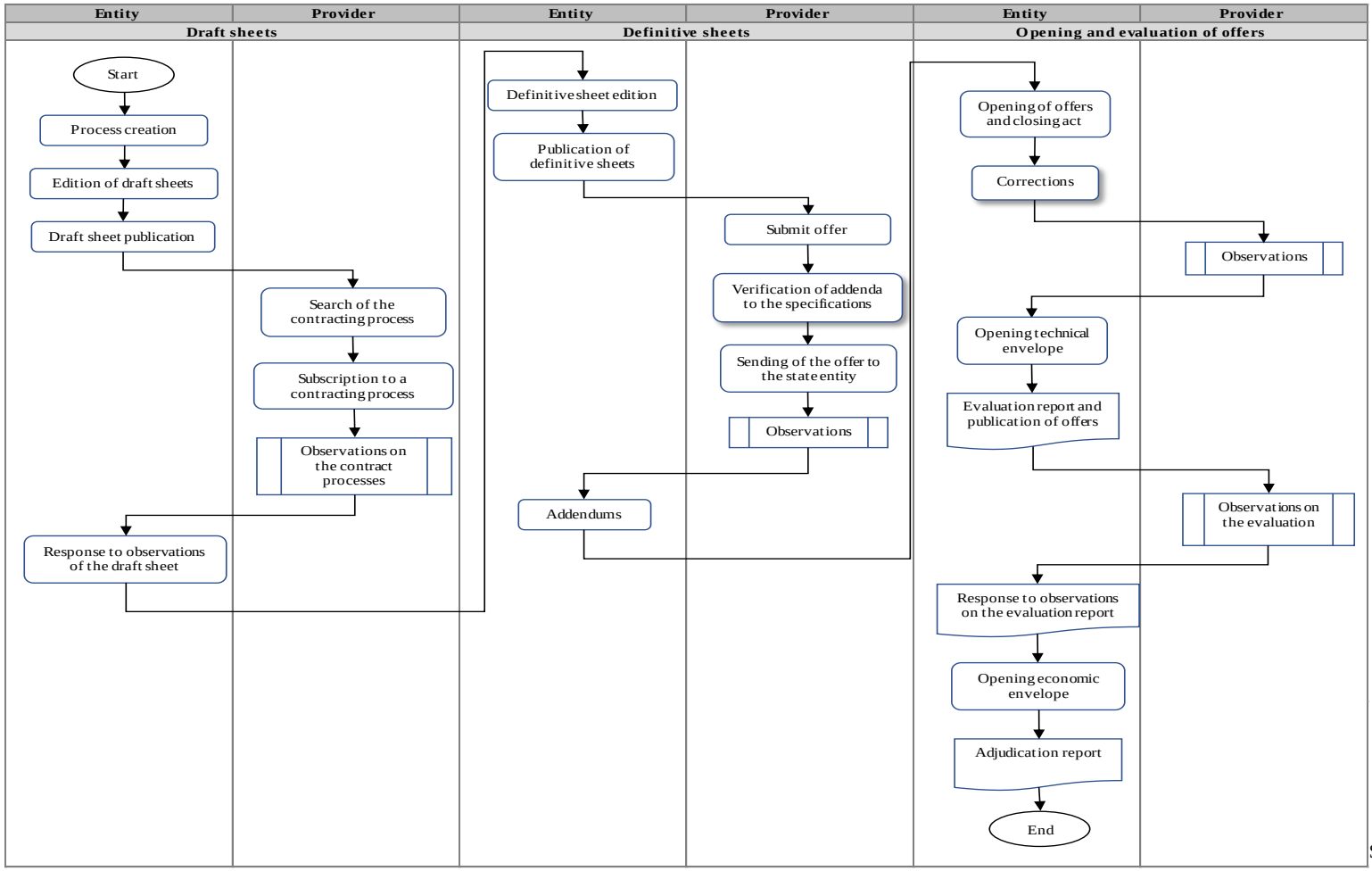
Figure 13. *Direct Contracting Flowchart*



Source: self-made

d. Merit Contest

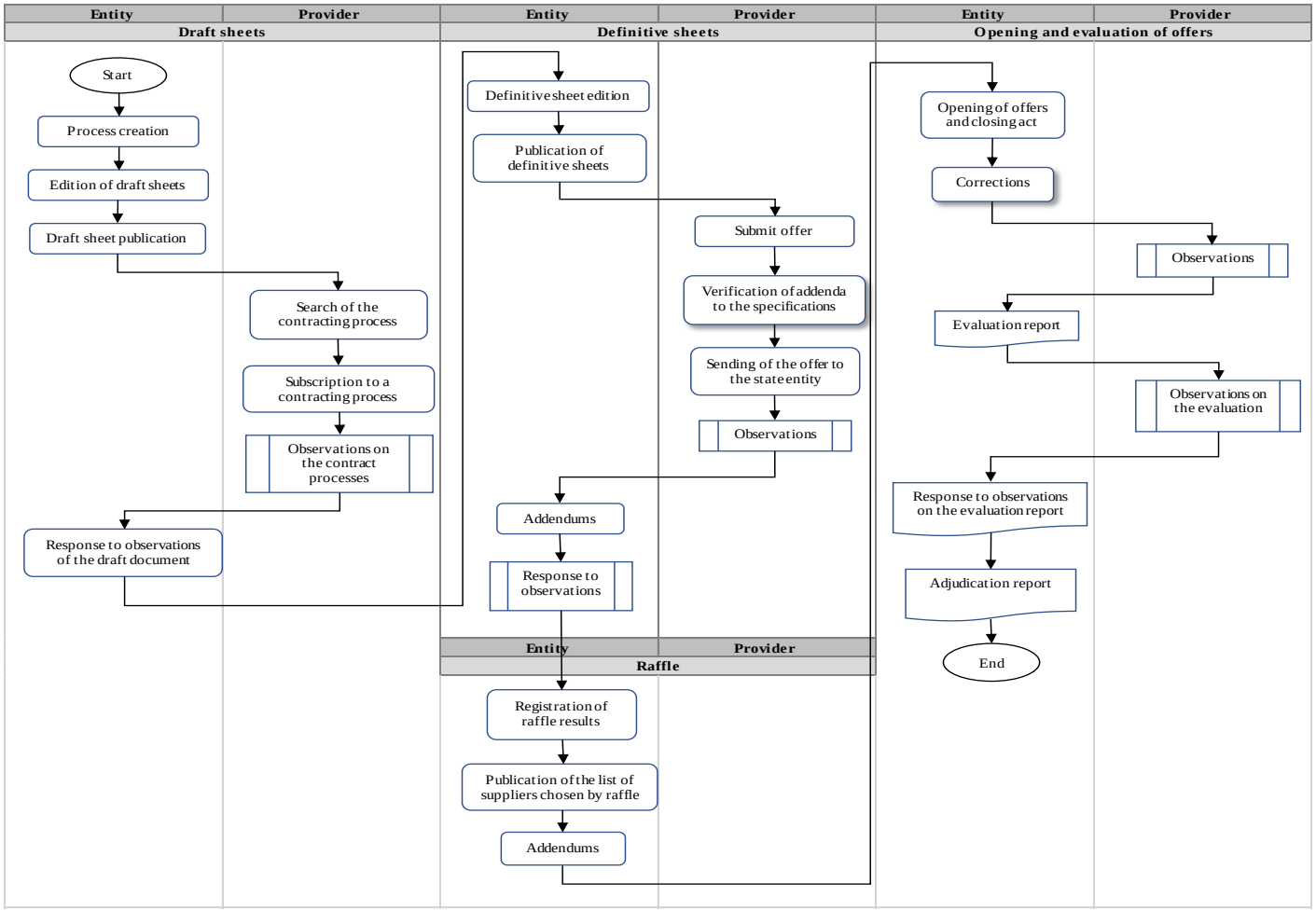
Figure 14. *Merit Contest Flowchart*



Source: self-made

e. Abbreviated Selection.

Figure 15. *Abbreviated Selection Flowchart*



Source: self-made

4.3. RATE INTERVENTION ANALYSIS (RIA)

The Rate Intervention (RIA) consists of an analysis that starts from PCM and PF where the operational, decision and control activities must be recorded, but this time the information from PF will be taken to specify in which cases each of these activities is carried out by an internal actor (buyers) and an external actor (providers). Scaled from the process characterized in PCM to scale it in the procedures inside it and finally record the operations attached to this procedure. For this analysis, it starts with a record of the procedures, activities and tasks in their respective order of execution.

In the Rate Intervention Analysis, the tasks to be carried out by entities and suppliers are entered to the matrix based on the procedure manuals, and their impact level in the contracting process management is valued. Consequently, these data shows:

Table 7. *Information obtained from the Rate Intervention Analysis*

General information	**information associated with the impact level**	**information associated with the impact level relation**
Total tasks number	Total number of tasks by impact level	
Entity's tasks number	Entity's number of tasks by impact level	Entity's impact level relation
Entity's intervention percentage		
Provider's tasks number	Provider's number of tasks by impact level	Provider's impact level relation
Provider's intervention percentage		

Source: self-made

As in the Procedures Dissection Maps and the Procedures Flowcharts, this valuation is made for the five general contracting methodologies published in Colombia: Public Biding, Minimum Amount, Direct Contracting, Merit Contest and Abbreviated Selection.

a. Public Bidding

Table 8. *Public Bidding Modality, Rate Intervention Analysis*

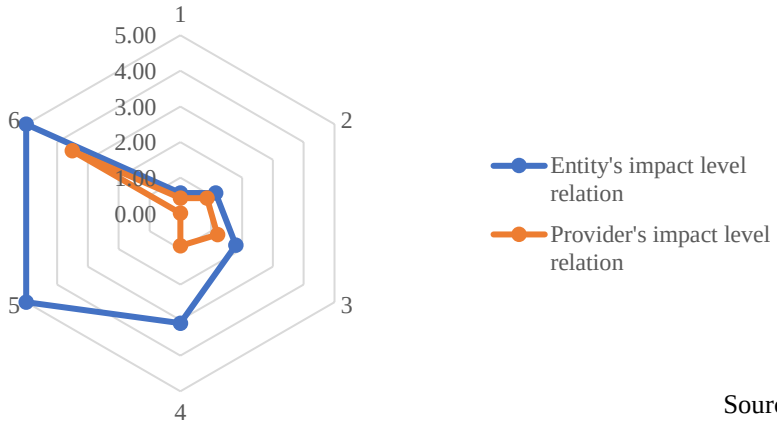
		Impact level in the contracting process management						
No.		1	2	3	4	5		No.
	Draft sheets						—	
	Process creation						—	
1	Enter to SECOP II		2				—	
2	Create process “Public Bidding”					5	—	
3	Fill in form to include basic data of the contracting process				4		—	
	Edition of draft sheets						—	
4	Create the electronic file of the contracting process					5	—	
5	Enable the edition of the specification		2				—	
6	Fill in general information of the specifications				4		—	
7	Edit “Description” for specification				4		—	
8	Edit “Classification of the good or service” for specifications				4		—	
9	Edit “Annual acquisitions plan” for specifications				4		—	
10	Edit “Contract information” for specifications				4		—	
11	Edit “Trade agreements” for specifications				4		—	
12	Edit “Notification address” for specifications				4		—	
13	Edit “Internal documents” for specifications				4		—	
14	Edit “Equipment configuration and approval flow” for specifications				4		—	
15	Fill in the configuration of the specifications				4		—	
16	Edit the dates of the contracting process milestones				4		—	
17	Edit “Financial Settings” for specifications				4		—	
18	Edit “Visits to the place of execution” for specifications				4		—	
19	Edit “Lots” for specifications				4		—	
20	Edit “Prices” for specifications				4		—	
21	Edit “Budget information” for specifications				4		—	
22	Edit “Advanced settings” for specifications				4		—	
23	Diligence questionnaire of the specifications				4		—	
24	Complete the evaluation of the specifications				4		—	
25	Process documents of the process of the specifications				4		—	
26	Diligence documents of the offer of the specifications				4		—	
	Draft sheet publication						—	
27	Publish the specifications of the contracting process					5	—	
	—						**Search of the contracting process**	
	—		2				Enter to SECOP II	1
	—		2				Find recruitment processes	2
	—						**Subscription to a contracting process**	
	—		2				Confirm subscription during the contracting process	3

	—		2				Confirm manifestation interest of participation in the contracting process	4
	—						**Observations on the contract processes**	
	—			3			Submit observations if necessary	5
	—				4		Upload documents to complement observations	6
	Process work area						—	
28	Response to observations of the draft document		2				—	
29	Answer observations and / or inquiries from suppliers			3			—	
	Definitive sheets						—	
	Definitive sheet edition						—	
30	Edit final sheet				4		—	
	Publication of definitive sheets						—	
31	Publish the specifications of the contracting process					5	—	
	—						**Submit offer**	
	—		2				Confirm offer quotation	7
	—				4		Fill in general information about the offer	8
	—		2				Select the participation lot	9
	—	1					Consult the information required by the entity	10
	—				4		Upload the documents requested by the entity	11
	—				4		Include economic offer	12
	—				4		Enter information corresponding to the envelopes (enabling, technical, economic)	13
	—						Upload documents corresponding to the envelopes (enabling, technical, economic)	14
	—						**Verification of addenda to the specifications**	
	—	1					Check addenda to the specifications	15
	—		2				Apply modifications to the offer	16
	—						**Sending of the offer to the state entity**	
	—	1					Verify the correct income of the offer	17
	—		2				Validate and present offer	18
	—		2				Make modifications if necessary	19
	—						**Observations**	
	—			3			Submit observations if necessary	20
	—				4		Upload documents to complement observations	21
	Addendums						—	
32	Adjust modification or addendums if necessary				4		—	
	Response to observations						—	
33	Access to “Observations to the process documents”		2				—	
34	Answer observations and / or inquiries from suppliers			3			—	
	Opening and evaluation of offers						—	
	Opening of offers and closing act						—	
35	Enter to the section list of offers		2				—	
36	Access to “Opening of offers”		2				—	
37	Publish list of bidders					5	—	
38	Create economic evaluation					5	—	
39	See analysis detail created by SECOP II	1					—	
40	Export report to Excel		2				—	
41	Consult general information of the offers			3			—	
42	Check supplier responses to questions from the purchasing entity	1					—	
43	Consult annexes presented by suppliers	1					—	
	Corrections						—	

44	Ask providers to meet enabling requirements			3			—	
45	Ask suppliers to clarify content of the offer			3			—	
	—			3			Clarifies requested content	22
	—				4		Upload documents that support the clarification	23
46	Download the additional documents presented		2				—	
47	Add additional documents submitted to the offer				4		—	
	Evaluation report						—	
48	Prepare evaluation report		2				—	
49	Enter to the file of the contracting process		2				—	
50	Create selection process reports					5	—	
51	Upload and append selection process reports				4		—	
52	Edit date and time limit for observations to the selection report				4		—	
53	Publish selection report					5	—	
	—						**Observations on the evaluation report**	
	—			3			Submit observations if necessary	24
	—				4		Upload documents to complement observations	25
	Response to observations on the evaluation report						—	
54	Consult comments received	1					—	
55	Answer the comments received			3			—	
	Adjudication report						—	
56	Enter “Reports of the selection process”		2				—	
57	Select “Offers in evaluation”		2				—	
58	Diligence position of suppliers				4		—	
59	Diligence score obtained by providers				4		—	
60	Diligence contract adjudication result				4		—	
61	Diligence selection contract adjudication				4		—	
62	Attach the documents supporting the selection				4		—	

Total tasks number	87
Entity's tasks number	62
Entity's intervention percentage	71%
Provider's tasks number	25
Provider's intervention percentage	29%

	1	2	3	4	5	f-u
Total number of tasks by impact level	7	21	10	35	8	87
Entity's number of tasks by impact level	4	12	6	27	8	87
Provider's number of tasks by impact level	3	9	4	8	0	61
Entity's impact level relation	0,57	1,14	1,80	3,09	5,00	5,00
Provider's impact level relation	0,43	0,86	1,20	0,91	0,00	3,51



Source: self-made

For Public Bidding modality the total number of tasks is 87 operations, of which 62 are executed by the purchasing entities, a value equivalent to 71% understood as intervention rate, while the number of tasks by suppliers is of 25, with an intervention percentage of 29%. In this modality, as can be seen in the others, the purchasing entities have a greater impact and control within the process, although the difference between the entities and the suppliers, respectively, is 0,57 and 0,43 points of operations for obtaining of information, 1,14 and 0,86 points for mobility operations in the system, 1,80 and 1,20 points for operations for the dialogue between parts, 3,09 and 0,91 points for platform feeding operations, 5,00 and 0,00 points for operations of direct affection or decision making and 5,00 and 3,51 for follow-up operations.

b. Minimum Amount

Table 9. *Minimum Amount Modality, Rate Intervention Analysis*

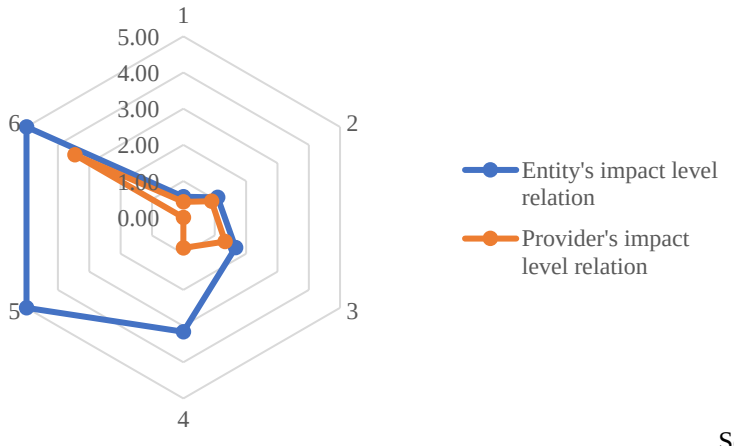
		Impact level in the contracting process management						
No.		1	2	3	4	5		No.
	Definitive sheets						—	
	Process creation						—	
1	Enter to SECOP II		2				—	
2	Create process “Minimum Amount”					5	—	
3	Fill in form to include basic data of the contracting process				4		—	
	Edition of definitive sheets					5	—	
4	Create the electronic file of the contracting process		2				—	
5	Enable the edition of the specification				4		—	
6	Fill in general information of the specifications				4		—	
7	Edit “Description” for specification				4		—	
8	Edit “Classification of the good or service” for specifications				4		—	
9	Edit “Annual acquisitions plan” for tender specifications				4		—	
10	Edit “Contract information” for specifications				4		—	
11	Edit “Notification address” for specifications				4		—	
12	Edit “Internal documents” for specifications				4		—	
13	Edit “Equipment configuration and approval flow” for specifications				4		—	
14	Fill in the configuration of the specifications				4		—	
15	Edit the dates of the hiring process milestones				4		—	
16	Edit “Financial Settings” for specifications				4		—	
17	Edit “Visits to the place of execution” for specifications				4		—	
18	Edit “Lots” for specifications				4		—	
19	Edit “Prices” for specifications				4		—	
20	Edit “Budget information” for specifications				4		—	
21	Edit “Advanced settings” for specifications				4		—	
22	Diligence questionnaire of the specifications				4		—	
23	Complete the evaluation of the specifications				4		—	
24	Process documents of the process of the specifications				4		—	
25	Diligence documents of the offer of the specifications				4		—	
	Publication of definitive specifications						—	
26	Publish the specifications of the contracting process					5	—	
	—						**Search of the contracting process**	
	—		2				Enter to SECOP II	1
	—		2				Find recruitment processes	2
	—						**Subscription to a contracting process**	
	—		2				Confirm subscription during the contracting process	3
	—		2				Confirm manifestation interest of participation in the contracting process	4
	—						**Observations on the contract processes**	
	—			3			Submit observations if necessary	5
	—				4		Upload documents to complement observations	6

	—						**Submit offer**	
	—		2				Confirm offer quotation	7
	—				4		Fill in general information about the offer	8
	—		2				Select the participation lot	9
	—	1					Consult the information required by the entity	10
	—				4		Upload the documents requested by the entity	11
	—				4		Include economic offer	12
	—				4		Enter information corresponding to the envelopes (enabling, technical, economic)	13
	—						Upload documents corresponding to the envelopes (enabling, technical, economic)	14
	—						**Verification of addenda to the specifications**	
	—	1					Check addenda to the specifications	15
	—		2				Apply modifications to the offer	16
	—						**Sending of the offer to the state entity**	
	—	1					Verify the correct income of the offer	17
	—		2				Validate and present offer	18
	—		2				Make modifications if necessary	19
	—						**Observations**	
	—			3			Submit observations if necessary	20
	—				4		Upload documents to complement observations	21
	Response to observations						—	
27	Access to “Observations to the process documents”		2				—	
28	Answer observations and / or inquiries from suppliers			3			—	
	Opening and evaluation of offers						—	
	Opening of offers and closing act						—	
29	Enter to the section list of offers		2				—	
30	Access to “Opening of offers”		2				—	
31	Publish list of bidders					5	—	
32	Create economic evaluation					5	—	
33	See analysis detail created by SECOP II	1					—	
34	Export report to Excel		2				—	
35	Consult general information of the offers			3			—	
36	Check supplier responses to questions from the purchasing entity	1					—	
37	Consult annexes presented by suppliers	1					—	
	Corrections						—	
38	Ask providers to meet enabling requirements			3			—	
39	Ask suppliers to clarify content of the offer			3			—	
	—			3			Clarifies requested content	22
	—				4		Upload documents that support the clarification	23
40	Download the additional documents presented		2				—	
41	Add additional documents submitted to the offer				4		—	
	Evaluation report						—	
42	Prepare evaluation report		2				—	
43	Enter to the file of the contracting process		2				—	
44	Create selection process reports					5	—	
45	Upload and append selection process reports				4		—	
46	Edit date and time limit for observations to the selection report				4		—	
47	Publish selection report					5	—	
							Observations on the evaluation report	

	—			3			Submit observations if necessary	24
	—				4		Upload documents to complement observations	25
	Response to observations on the evaluation report						—	
48	Consult comments received	1					—	
49	Answer the comments received			3			—	
	Adjudication report						—	
50	Enter “Reports of the selection process”		2				—	
51	Select “Offers in evaluation”		2				—	
52	Diligence position of suppliers				4		—	
53	Diligence score obtained by providers				4		—	
54	Diligence contract adjudication result				4		—	
55	Diligence selection contract award				4		—	
56	Attach the documents supporting the selection				4		—	

Total tasks number	81
Entity's tasks number	56
Entity's intervention percentage	69%
Provider's tasks number	25
Provider's intervention percentage	31%

	1	2	3	4	5	f-u
Total number of tasks by impact level	7	20	9	38	7	81
Entity's number of tasks by impact level	4	11	5	30	7	81
Provider's number of tasks by impact level	3	9	4	8	0	56
Entity's impact level relation	0,57	1,10	1,67	3,16	5,00	5,00
Provider's impact level relation	0,43	0,90	1,33	0,84	0,00	3,46



Source: self-made

For Minimum Amount modality the total number of tasks is 81 operations, of which 56 are executed by the purchasing entities, a value equivalent to 69% understood as intervention rate, while the number of tasks by suppliers is of 25, with an intervention percentage of 31%. In this modality, as can be seen in the others, the purchasing entities have a greater impact and control within the process, although the difference between the

entities and the suppliers, respectively, is 0,57 and 0,43 points of operations for obtaining of information, 1,10 and 0,90 points for mobility operations in the system, 1,67 and 1,30 points for operations for the dialogue between parts, 3,16 and 0,84 points for platform feeding operations, 5,00 and 0,00 points for operations of direct affection or decision making and 5,00 and 3,46 for follow-up operations.

c. Direct Contracting

Table 10. *Direct Contracting Modality, Rate Intervention Analysis*

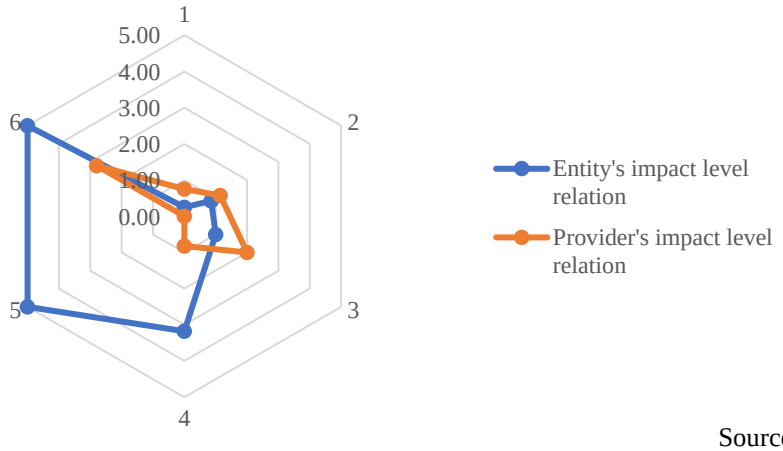
		Impact level in the contracting process management						
No.		1	2	3	4	5		No.
	Reference terms						—	
	Process creation						—	
1	Enter to SECOP II		2				—	
2	Create process “Direct Contracting”					5	—	
3	Fill in form to include basic data of the contracting process				4		—	
	Editing the terms of reference						—	
4	Create the electronic file of the contracting process					5	—	
5	Enable the edition of the terms of reference		2				—	
6	Fill out general information on the terms of reference				4		—	
7	Edit “Description” for the terms of reference				4		—	
8	Edit “Classification of the good or service” for the terms of reference				4		—	
9	Edit “Annual procurement plan” for the terms of reference				4		—	
10	Edit “Contract information” for the terms of reference				4		—	
11	Edit “Notification address” for the terms of reference				4		—	
12	Edit “Internal documents” for the terms of reference				4		—	
13	Edit “Team configuration and approval flow” for the terms of reference				4		—	
14	Complete configuration for the terms of reference				4		—	
15	Edit the dates of milestones for the terms of reference				4		—	
16	Edit “Financial Settings” for the terms of reference				4		—	
17	Edit “Visits to the place of execution” for the terms of reference				4		—	
18	Edit “Lots” for the terms of reference				4		—	
19	Edit “Prices” for the terms of reference				4		—	
20	Edit “Budget information” for the terms of reference				4		—	
21	Edit “Advanced settings” for the terms of reference				4		—	
22	Diligence questionnaire for the terms of reference				4		—	
23	Process documents for the terms of reference				4		—	
24	Upload complementary documents				4		—	
25	Fill in tender documents for the terms of reference				4		—	
26	Select contractors by invitation to sign the contract		2				—	
	Publication of the terms of reference						—	
27	Publish the terms of reference of the contracting process					5	—	
	Modification of the terms of reference						—	
28	Make modifications to the terms of reference				4		—	
	—						**Search of the contracting process**	
	—		2				Enter to SECOP II	1
	—		2				Find recruitment processes	2

	—						**Subscription to a contracting process**	
	—		2				Confirm subscription during the contracting process	3
	—		2				Confirm manifestation interest of participation in the contracting process	4
	—						**Observations on the contract processes**	
	—			3			Submit observations if necessary	5
	—				4		Upload documents to complement observations	6
	—						**Submit offer**	
	—		2				Confirm offer quotation	7
	—				4		Fill in general information about the offer	8
	—		2				Select the participation lot	9
	—	1					Consult the information required by the entity	10
	—				4		Upload the documents requested by the entity	11
	—				4		Include economic offer	12
	—				4		Enter information corresponding to the envelopes (enabling, technical, economic)	13
	—				4		Upload documents corresponding to the envelopes (enabling, technical, economic)	14
	—						**Verification of addenda to the specifications**	
	—	1					Check addenda to the specifications	15
	—		2				Apply modifications to the offer	16
	—						**Sending of the offer to the state entity**	
	—	1					Verify the correct income of the offer	17
	—		2				Validate and present offer	18
	—						Make modifications if necessary	19
	—						**Observations**	
	—			3			Submit observations if necessary	20
	—				4		Upload documents to complement observations	21
	Response to observations						—	
29	Access to “Observations to the process documents”		2				—	
30	Answer observations and / or inquiries from suppliers			3			—	
	Documents review						—	
	Review of contractors' documents						—	
31	Review the documents of the suppliers	1					—	
	Adjudication of the contracting process						—	
32	Enter to “Reports of the selection process”		2				—	
33	Select “Offers in evaluation”		2				—	
34	Diligence position of suppliers				4		—	
35	Diligence score obtained by providers				4		—	
36	Diligence contract adjudication result				4		—	
37	Diligence selection contract adjudication				4		—	
38	Attach the documents supporting the selection				4		—	

Total tasks number	59
Entity's tasks number	38
Entity's intervention percentage	64%
Provider's tasks number	21
Provider's intervention percentage	36%

	1	2	3	4	5	f-u
Total number of tasks by impact level	4	14	3	34	3	59

Entity's number of tasks by impact level	1	6	1	27	3	59
Provider's number of tasks by impact level	3	8	2	7	0	33
Entity's impact level relation	0,25	0,86	1,00	3,18	5,00	5,00
Provider's impact level relation	0,75	1,14	2,00	0,82	0,00	2,80



Source: self-made

For Direct Contracting modality the total number of tasks is 59 operations, of which 38 are executed by the purchasing entities, a value equivalent to 64% understood as intervention rate, while the number of tasks by suppliers is of 21, with an intervention percentage of 36%. In this modality, as can be seen in the others, the purchasing entities have a greater impact and control within the process, although the difference between the entities and the suppliers, respectively, is 0,25 and 0,75 points of operations for obtaining of information, 0,86 and 1,14 points for mobility operations in the system, 1,00 and 2,00 points for operations for the dialogue between parts, 3,18 and 0,82 points for platform feeding operations, 5,00 and 0,00 points for operations of direct affection or decision making and 5,00 and 2,80 for follow-up operations.

d. Merit Contest

Table 11. *Merit Contest Modality, Rate Intervention Analysis*

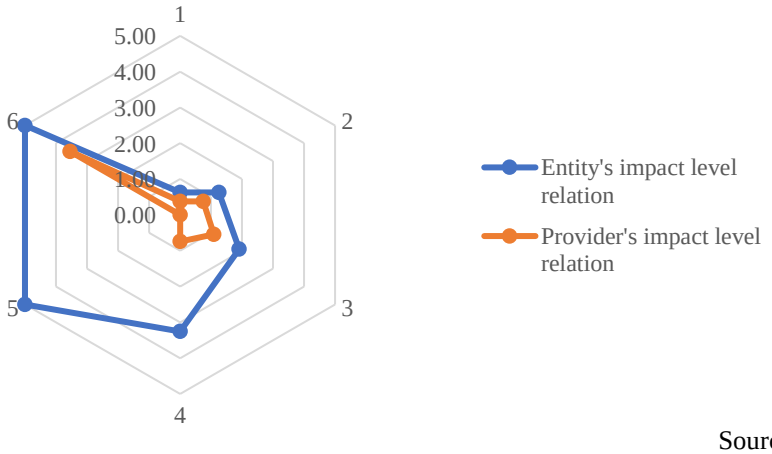
		Impact level in the contracting process management						
No.		1	2	3	4	5		No.
	Draft sheets						—	
	Process creation						—	
1	Enter to SECOP II		2				—	
2	Create process “Merit Contest”					5	—	
3	Fill in form to include basic data of the contracting process				4		—	
	Edition of draft sheets						—	
4	Create the electronic file of the contracting process					5	—	
5	Enable the edition of the specification		2				—	
6	Fill in general information of the specifications				4		—	
7	Edit “Description” for specification				4		—	
8	Edit “Classification of the good or service” for specifications				4		—	
9	Edit “Annual acquisitions plan” for specifications				4		—	
10	Edit “Contract information” for specifications				4		—	
11	Edit “Trade agreements” for specifications				4		—	
12	Edit “Notification address” for specifications				4		—	
13	Edit “Internal documents” for specifications				4		—	
14	Edit “Equipment configuration and approval flow” for specifications				4		—	
15	Fill in the configuration of the specifications				4		—	
16	Edit the dates of the contracting process milestones				4		—	
17	Edit “Financial Settings” for specifications				4		—	
18	Edit “Visits to the place of execution” for specifications				4		—	
19	Edit “Lots” for specifications				4		—	
20	Edit “Prices” for specifications				4		—	
21	Edit “Budget information” for specifications				4		—	
22	Edit “Advanced settings” for specifications				4		—	
23	Diligence questionnaire of the specifications				4		—	
24	Edit “Enabling envelope” for specifications				4		—	
25	Edit “Technical envelope” for specifications				4		—	
26	Edit “Economic envelope” for specifications				4		—	
27	Complete the evaluation of the specifications				4		—	
28	Process documents of the process of the specifications				4		—	
	Draft sheet publication						—	
29	Publish the specifications of the contracting process					5	—	
	—						**Search of the contracting process**	
	—		2				Enter to SECOP II	1
	—		2				Find recruitment processes	2
	—						**Subscription to a contracting process**	
	—		2				Confirm subscription during the contracting process	3
	—		2				Confirm manifestation interest of participation in the contracting process	4
	—						**Observations on the contract processes**	

	—			3			Submit observations if necessary	5
	—				4		Upload documents to complement observations	6
	Response to observations of the draft sheet						—	
30	Access to “Observations to the process documents”		2				—	
31	Answer observations and / or inquiries from suppliers			3			—	
	Definitive sheets						—	
	Definitive sheet edition						—	
32	Edit final sheet				4		—	
	Publication of definitive sheets						—	
33	Publish the specifications of the contracting process					5	—	
	—						**Submit offer**	
	—		2				Confirm offer quotation	7
	—				4		Fill in general information about the offer	8
	—		2				Select the participation lot	9
	—	1					Consult the information required by the entity	10
	—				4		Upload the documents requested by the entity	11
	—				4		Include economic offer	12
	—				4		Enter information corresponding to the envelopes (enabling, technical, economic)	13
	—						Upload documents corresponding to the envelopes (enabling, technical, economic)	14
	—						**Verification of addenda to the specifications**	
	—	1					Check addenda to the specifications	15
	—		2				Apply modifications to the offer	16
	—						**Sending of the offer to the state entity**	
	—	1					Verify the correct income of the offer	17
	—		2				Validate and present offer	18
	—		2				Make modifications if necessary	19
	—						**Observations**	
	—			3			Submit observations if necessary	20
	—				4		Upload documents to complement observations	21
	Addendums						—	
34	Adjust modification or addendums if necessary				4		—	
35	Response to observations			3			—	
36	Access to “Observations to the process documents”		2				—	
37	Answer observations and / or inquiries from suppliers			3			—	
	Opening and evaluation of offers						—	
	Opening of offers and closing act						—	
38	Enter to the section list of offers		2				—	
39	Access to “Opening of offers”		2				—	
40	Publish list of bidders					5	—	
41	Create economic evaluation					5	—	
42	See analysis detail created by SECOP II	1					—	
43	Export report to Excel		2				—	
44	Consult general information of the offers			3			—	
45	Check supplier responses to questions from the purchasing entity	1					—	
46	Consult annexes presented by suppliers	1					—	
	Corrections						—	
47	Ask providers to meet enabling requirements			3			—	

48	Ask suppliers to clarify content of the offer			3			—	
	—			3			Clarifies requested content	22
	—				4		Upload documents that support the clarification	23
49	Download the additional documents presented		2				—	
50	Add additional documents submitted to the offer				4		—	
	Opening technical envelope						—	
51	Accept proposals that meet the enabling requirements		2				—	
52	Consult technical proposals from suppliers	1					—	
	Evaluation report and publication of offers						—	
53	Publish offers					5	—	
54	Prepare evaluation report		2				—	
55	Enter to the file of the contracting process		2				—	
56	Create selection process reports					5	—	
57	Upload and append selection process reports				4		—	
58	Edit date and time limit for observations to the selection report				4		—	
59	Publish rating report					5	—	
	—						**Observations on the evaluation report**	
	—			3			Submit observations if necessary	24
	—				4		Upload documents to complement observations	25
	Response to observations on the evaluation report						—	
60	Consult comments received	1					—	
61	Answer the comments received			3			—	
	Opening economic envelope						—	
62	Admit the offer with the best technical offer		2				—	
63	Confirm exclusion from other providers		2				—	
64	Upload justification for provider exclusion				4		—	
	Adjudication report						—	
65	Enter to “Reports of the selection process”		2				—	
66	Select “Offers in evaluation”		2				—	
67	Diligence position of suppliers				4		—	
68	Diligence score obtained by providers				4		—	
69	Diligence contract adjudication result				4		—	
70	Diligence selection contract adjudication				4		—	
71	Attach the documents supporting the selection				4		—	

Total tasks number	96
Entity's tasks number	71
Entity's intervention percentage	74%
Provider's tasks number	25
Provider's intervention percentage	26%

	1	2	3	4	5	f-u
Total number of tasks by impact level	8	24	11	43	9	96
Entity's number of tasks by impact level	5	15	7	35	9	96
Provider's number of tasks by impact level	3	9	4	8	0	68
Entity's impact level relation	0,63	1,25	1,91	3,26	5,00	5,00
Provider's impact level relation	0,38	0,75	1,09	0,74	0,00	3,54



Source: self-made

For Merit Contest modality the total number of tasks is 96 operations, of which 71 are executed by the purchasing entities, a value equivalent to 74% understood as intervention rate, while the number of tasks by suppliers is of 25, with an intervention percentage of 26%. In this modality, as can be seen in the others, the purchasing entities have a greater impact and control within the process, although the difference between the entities and the suppliers, respectively, is 0,63 and 0,38 points of operations for obtaining of information, 1,25 and 0,75 points for mobility operations in the system, 1,91 and 1,09 points for operations for the dialogue between parts, 3,26 and 0,74 points for platform feeding operations, 5,00 and 0,00 points for operations of direct affection or decision making and 5,00 and 3,54 for follow-up operations.

e. Abbreviated Selection

Table 12. *Abbreviated Selection Modality, Rate Intervention Analysis*

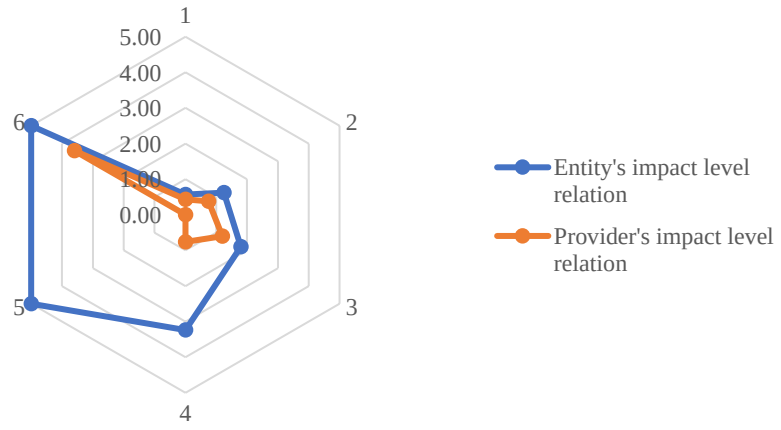
		Impact level in the contracting process management						
No.		1	2	3	4	5		No.
	Draft sheets						—	
	Process creation						—	
1	Enter to SECOP II		2				—	
2	Create process “Abbreviated Selection”					5	—	
3	Fill in form to include basic data of the contracting process				4		—	
	Edition of draft sheets						—	
4	Create the electronic file of the contracting process					5	—	
5	Enable the edition of the specification		2				—	
6	Fill in general information of the specifications				4		—	
7	Edit “Description” for specification				4		—	
8	Edit “Classification of the good or service” for specifications				4		—	
9	Edit “Annual acquisitions plan” for specifications				4		—	
10	Edit “Contract information” for specifications				4		—	
11	Edit “Trade agreements” for specifications				4		—	
12	Edit “Notification address” for specifications				4		—	
13	Edit “Internal documents” for specifications				4		—	
14	Edit “Equipment configuration and approval flow” for specifications				4		—	
15	Fill in the configuration of the specifications				4		—	
16	Edit the dates of the contracting process milestones				4		—	
17	Edit “Financial Settings” for specifications				4		—	
18	Edit “Visits to the place of execution” for specifications				4		—	
19	Edit “Lots” for specifications				4		—	
20	Edit “Prices” for specifications				4		—	
21	Edit “Budget information” for specifications				4		—	
22	Edit “Advanced settings” for specifications				4		—	
23	Diligence questionnaire of the specifications				4		—	
24	Complete the evaluation of the specifications				4		—	
25	Process documents of the process of the specifications				4		—	
26	Diligence documents of the offer of the specifications				4		—	
	Draft sheet publication						—	
27	Publish the specifications of the contracting process					5	—	
	—						**Search of the contracting process**	
	—		2				Enter to SECOP II	1
	—		2				Find recruitment processes	2
	—						**Subscription to a contracting process**	
	—		2				Confirm subscription during the contracting process	3
	—		2				Confirm manifestation interest of participation in the contracting process	4
	—						**Observations on the contract processes**	
	—			3			Submit observations if necessary	5

	—				4		Upload documents to complement observations	6
	Response to observations of the draft document						—	
28	Access to “Observations to the process documents”		2				—	
29	Answer observations and / or inquiries from suppliers			3			—	
	Definitive sheets						—	
	Definitive sheet edition						—	
30	Edit final sheet				4		—	
	Publication of definitive specifications						—	
31	Publish the specifications of the contracting process					5	—	
	—						**Submit offer**	
	—		2				Confirm offer quotation	7
	—				4		Fill in general information about the offer	8
	—		2				Select the participation lot	9
	—	1					Consult the information required by the entity	10
	—				4		Upload the documents requested by the entity	11
	—				4		Include economic offer	12
	—				4		Enter information corresponding to the envelopes (enabling, technical, economic)	13
	—						Upload documents corresponding to the envelopes (enabling, technical, economic)	14
	—						**Verification of addenda to the specifications**	
	—	1					Check addenda to the specifications	15
	—		2				Apply modifications to the offer	16
	—						**Sending of the offer to the state entity**	
	—	1					Verify the correct income of the offer	17
	—		2				Validate and present offer	18
	—		2				Make modifications if necessary	19
	—						**Observations**	
	—			3			Submit observations if necessary	20
	—				4		Upload documents to complement observations	21
	Addendums						—	
32	Adjust modification or addendums if necessary				4		—	
	Response to observations						—	
33	Access to “Observations to the process documents”		2				—	
34	Answer observations and / or inquiries from suppliers			3			—	
	Raffle						—	
	Registration of raffle results						—	
35	Confirme realization of the raffle		2				—	
36	Select the suppliers that were not chosen in the raffle		2				—	
37	Publish the actual lottery update					5	—	
	Publication of the list of suppliers chosen by raffle						—	
38	Enter raffle results				4		—	
39	Enable invitation for selected suppliers		2				—	
	Addendums						—	
40	Adjust modification or addendums if necessary				4		—	
	Opening and evaluation of offers						—	
	Opening of offers and closing act						—	
41	Enter to the section list of offers		2				—	

42	Access to “Opening of offers”		2				—	
43	Publish list of bidders					5	—	
44	Create economic evaluation					5	—	
45	See analysis detail created by SECOP II	1					—	
46	Export report to Excel		2				—	
47	Consult general information of the offers			3			—	
48	Check supplier responses to questions from the purchasing entity	1					—	
49	Consult annexes presented by suppliers	1					—	
	Corrections						—	
50	Ask providers to meet enabling requirements			3			—	
51	Ask suppliers to clarify content of the offer			3			—	
	—			3			Clarifies requested content	22
	—				4		Upload documents that support the clarification	23
52	Download the additional documents presented		2				—	
53	Add additional documents submitted to the offer				4		—	
	Evaluation report and publication of offers						—	
54	Prepare evaluation report		2				—	
55	Enter to the file of the contracting process		2				—	
56	Create selection process reports					5	—	
57	Upload and append selection process reports				4		—	
58	Edit date and time limit for observations to the selection report				4		—	
59	Publish selection report					5	—	
	—						**Observations on the evaluation report**	
	—			3			Submit observations if necessary	24
	—				4		Upload documents to complement observations	25
	Response to observations on the evaluation report						—	
60	Consult comments received	1					—	
61	Answer the comments received			3			—	
	Adjudication report						—	
62	Enter to “Reports of the selection process”		2				—	
63	Select “Offers in evaluation”		2				—	
64	Diligence position of suppliers				4		—	
65	Diligence score obtained by providers				4		—	
66	Diligence contract adjudication result				4		—	
67	Diligence selection contract adjudication				4		—	
68	Attach the documents supporting the selection				4		—	

Total tasks number	93
Entity's tasks number	68
Entity's intervention percentage	73%
Provider's tasks number	25
Provider's intervention percentage	27%

	1	2	3	4	5	f-u
Total number of tasks by impact level	7	24	10	42	9	93
Entity's number of tasks by impact level	4	15	6	34	9	93
Provider's number of tasks by impact level	3	9	4	8	0	67
Entity's impact level relation	0,57	1,25	1,80	3,24	5,00	5,00
Provider's impact level relation	0,43	0,75	1,20	0,76	0,00	3,60



Source: self-made

For Abbreviated Selection modality the total number of tasks is 93 operations, of which 68 are executed by the purchasing entities, a value equivalent to 73% understood as intervention rate, while the number of tasks by suppliers is of 25, with an intervention percentage of 27%. In this modality, as can be seen in the others, the purchasing entities have a greater impact and control within the process, although the difference between the entities and the suppliers, respectively, is 0,57 and 0,43 points of operations for obtaining of information, 1,25 and 0,75 points for mobility operations in the system, 1,80 and 1,20 points for operations for the dialogue between parts, 3,24 and 0,76 points for platform feeding operations, 5,00 and 0,00 points for operations of direct affection or decision making and 5,00 and 3,60 for follow-up operations.

5. CHAPTER V: RESULTS

Following is a presentation of the results of the mapping and the processed information, going through an analysis of the elements of study of this document such as traceability, relations between buyers and suppliers and finally the findings made based on the observation and comparison of the contracting modalities planned for this study.

5.1. PROCESS MAPPING

After having mapped the processes, the component procedures and subsequently having made flow diagrams and analysing the impact and relevance of the entities and suppliers, results are obtained that allow an analysis of the information used and its relevance for the present study.

The process of public procurement management in the entity *Colombia Compra Eficiente*, through the use of the SECOP II online system, is a basis that gives the premises and guidelines for the follow-up of all entities in Colombia. These guidelines are documented in the processes of manuals and procedures where it is defined punctually and clearly which are from the strategies to each of the steps to be carried out for the effective and timely execution of any process and procedure. The documents and maps that show the structure and components of electronic public procurement management processes in Colombia provide information to understand the scope, instruments and responsibilities of each process, and of each of the people who are part of the execution of those processes.

The Process Characterization Map (PCM), the Procedures Flowcharts (PFs) and the Rate Intervention Analysis (RIA), show the process of public contract management at different levels of breadth and detail, allowing a scale analysis that in turn allows to observe the general and specific relationship of its content. The PCM show the lean components at the process level, and then with lean components at the procedure level. Subsequently, the PFs show a more detailed level of flow within the procedures, and finally in the RIA the flow components are related in a much more specific way according to the relationships between entities and buyers and their level of impact within the process.

5.2. ANALYSIS

The analysis to be done next is done on three lines of observation that will make an observation of the elements of this investigation. First, an analysis of traceability is carried out as a monitoring strategy for observing the public procurement management process in Colombia. Next, an analysis is carried out on the relationship between purchasing entities and suppliers and the values thrown according to the impact of the actions they perform within the process. Subsequently, the contracting modalities are compared and the aspects that comprise them are observed.

5.2.1. Components Defined for the Study of Traceability

The traceability within the public procurement management processes in Colombia and the entity *Colombia Compra Eficiente* was conceptualized as the monitoring of the process and its parts based on five different forms of action by entities and suppliers within the process. These forms of action denote a finished level of impact within the process, which in turn shows different ways of being part and acting within the process. The actions were classified according to the way in which the actions carried out by entities or suppliers affected the parties in the process or the same process. These forms of action were:

- *Observation*. It considers all types of actions that involve exclusively information search, observation of contents, observations of publications, recognition of the SECOP II electronic system website areas for online contracting in Colombia.
- *Mobility in the system*. It considers all types of actions that exclusively involve access and mobility between areas of the SECOP II electronic system website for online contracting in Colombia.
- *Dialog between parts*. It considers all types of actions that exclusively involve communication between the entity and the suppliers, either through a forum or consultations in the process within the SECOP II electronic system website for online contracting in Colombia.

- *Transactionality of content*. It considers all types of actions that exclusively involve loading and unloading content of material and information that makes up each of the contracting processes within the SECOP II electronic system for online contracting in Colombia.
- *Direct affection / Decision making*. It considers all types of actions that involve exclusively making decisions or actions that significantly affect the course of the contracting processes within the SECOP II electronic system for online contracting in Colombia.

Each of these forms of actions was given a score to quantify the level of total affection that these actions would have within the process. The scores given values were:

- *Observation*. 1
- *Mobility in the system*. 2
- *Dialog between parts*. 3
- *Transactionality of content*. 4
- *Direct affection / Decision making*. 5

After the respective weighting, summation and getting percentages of these values, the results obtained define in each of the contracting modalities in Colombia Total tasks number, Entity's tasks number, Entity's intervention percentage, Provider's tasks number, Provider's intervention percentage, Total number of tasks by impact level, Entity's number of tasks by impact level, Provider's number of tasks by impact level, Entity's impact level relation, and Provider's impact level relation.

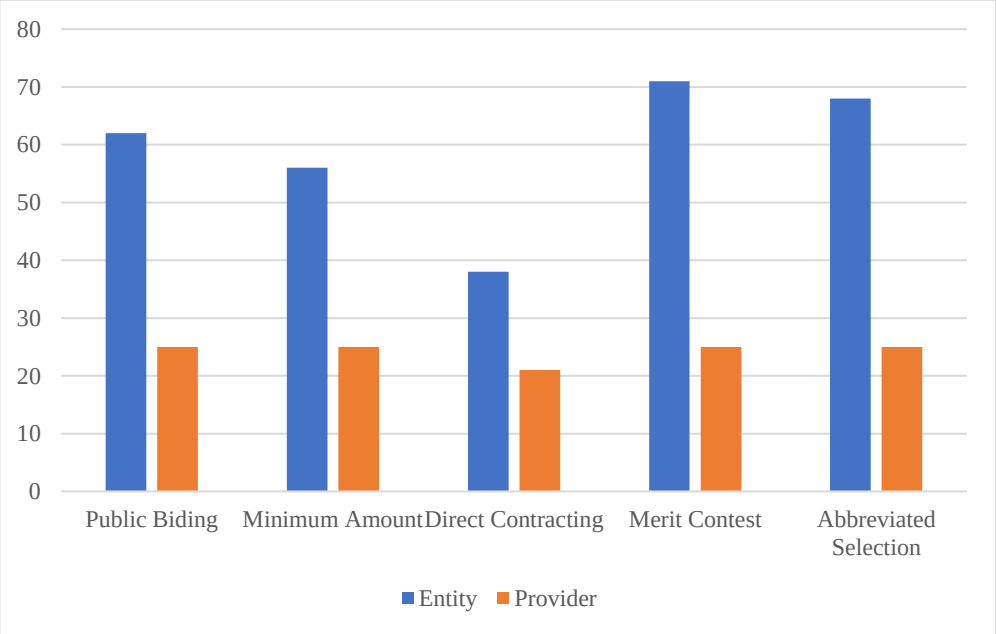
Table 13. *Contracting Modalities Tasks Relation*

	Public Biding	Minimum Amount	Direct Contracting	Merit Contest	Abbreviated Selection
Total tasks number	87	81	59	96	93
Entity's tasks number	62	56	38	71	68
Entity's intervention percentage	71%	69%	64%	74%	73%
Provider's tasks number	25	25	21	25	25
Provider's intervention percentage	29%	31%	36%	26%	27%

Source: self-made

For Public Bidding modality the total number of tasks is 87 operations, of which 62 are executed by the purchasing entities, a value equivalent to 71% understood as intervention rate, while the number of tasks by suppliers is of 25, with an intervention percentage of 29%. For Minimum Amount modality the total number of tasks is 81 operations, of which 56 are executed by the purchasing entities, a value equivalent to 69% understood as intervention rate, while the number of tasks by suppliers is of 25, with an intervention percentage of 31%. For Direct Contracting modality the total number of tasks is 59 operations, of which 38 are executed by the purchasing entities, a value equivalent to 64% understood as intervention rate, while the number of tasks by suppliers is of 21, with an intervention percentage of 36%. For Merit Contest modality the total number of tasks is 96 operations, of which 71 are executed by the purchasing entities, a value equivalent to 74% understood as intervention rate, while the number of tasks by suppliers is of 25, with an intervention percentage of 26%. For Abbreviated Selection modality the total number of tasks is 93 operations, of which 68 are executed by the purchasing entities, a value equivalent to 73% understood as intervention rate, while the number of tasks by suppliers is of 25, with an intervention percentage of 27%.

Figure 16. *Contracting Modalities Tasks Number*



Source: self-made

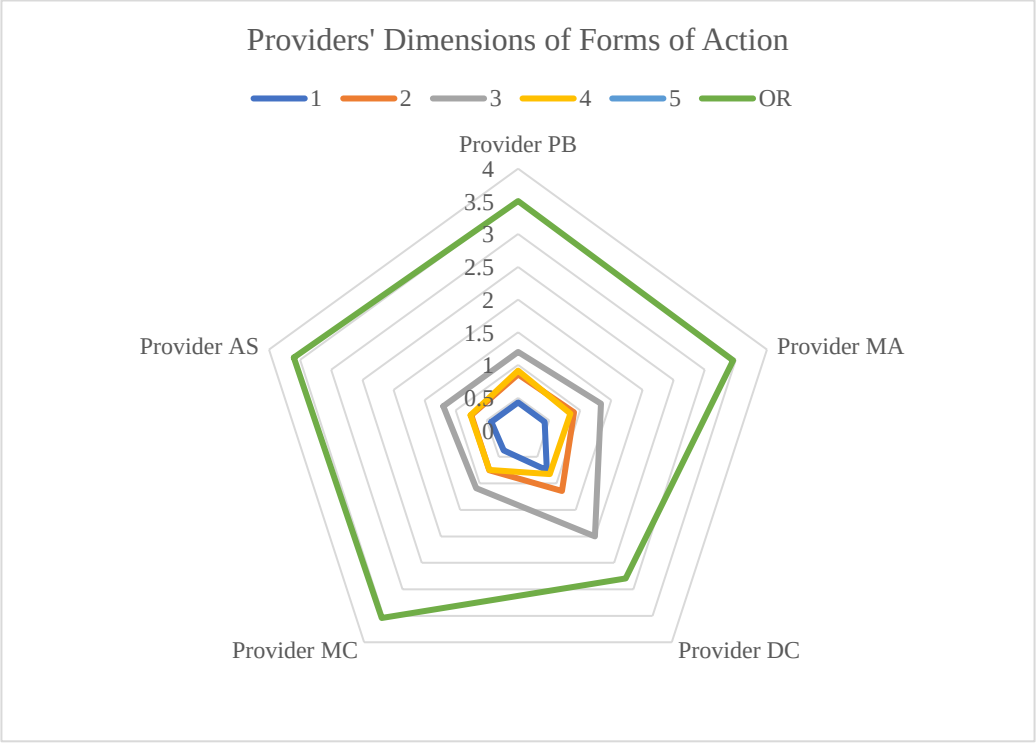
Also depending on the traceability within these processes, the intervention rate of the entities, with respect to suppliers considerably higher, although in turn there are clear differences between each of the contracting modalities. Although the main variables that show a basic difference between the contracting modalities is the total number of tasks, the ways of acting within the processes by the entities and the suppliers, denote a different way of understanding the level of impact, monitoring and control by them.

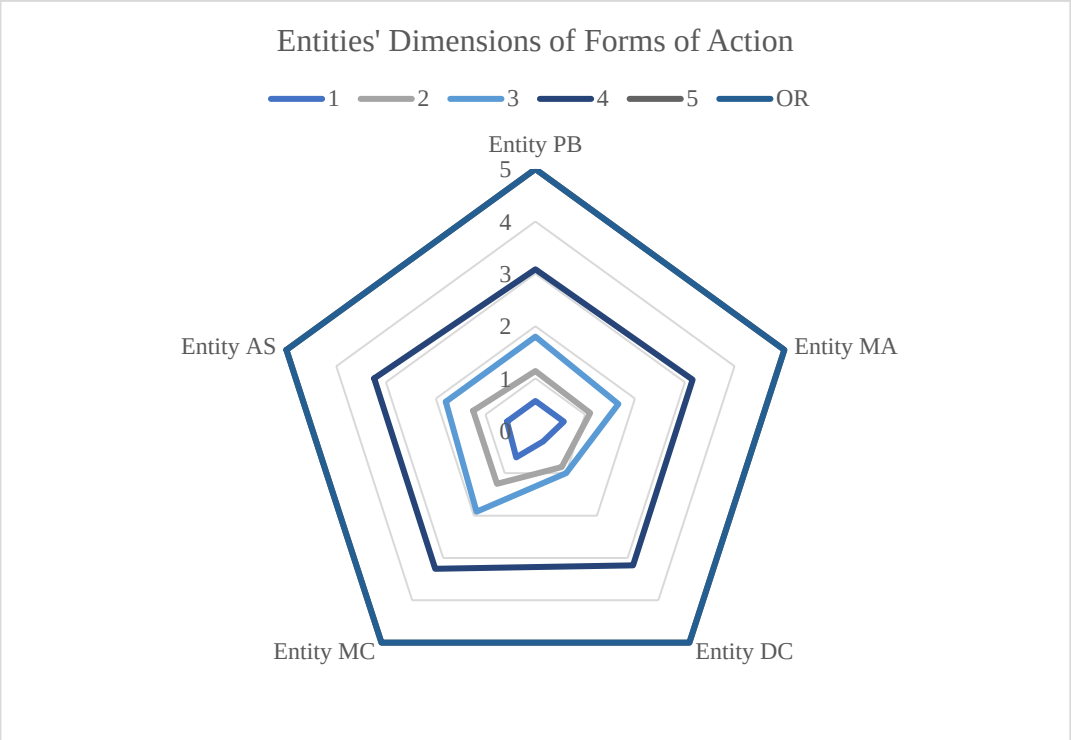
The traceability understood based on the different forms of action within the process exposes a clear difference between each one of the modalities. Which in turn implies that the traceability as a general concept implicit to the process does not vary, but the ways in which it materializes if it is conditioned and varies depending on each of the actions that can be done by the purchasing entities and the provider entities of goods and services.

In all the modalities the purchasing entities have a greater impact and control within the process. In the Public Biding modality, the difference between the entities and the suppliers, respectively, is 0,57 and 0,43 points of operations for obtaining of information, 1,14 and 0,86 points for mobility operations in the system, 1,80 and 1,20 points for operations for the dialogue between parts, 3,09 and 0,91 points for platform feeding operations, 5,00 and 0,00 points for operations of direct affection or decision making and 5,00 and 3,51 for follow-up operations. For the case of the Minimum Amount modality the difference between the entities and the suppliers, respectively, is 0,57 and 0,43 points of operations for obtaining of information, 1,10 and 0,90 points for mobility operations in the system, 1,67 and 1,30 points for operations for the dialogue between parts, 3,16 and 0,84 points for platform feeding operations, 5,00 and 0,00 points for operations of direct affection or decision making and 5,00 and 3,46 for follow-up operations. Then for the Direct Contracting modality the difference between the entities and the suppliers, respectively, is 0,25 and 0,75 points of operations for obtaining of information, 0,86 and 1,14 points for mobility operations in the system, 1,00 and 2,00 points for operations for the dialogue between parts, 3,18 and 0,82 points for platform feeding operations, 5,00 and 0,00 points for operations of direct affection or decision making and 5,00 and 2,80 for follow-up operations. In the case of the Merit Contest modality the difference between the entities and the suppliers, respectively, is 0,63 and 0,38 points of operations for

obtaining of information, 1,25 and 0,75 points for mobility operations in the system, 1,91 and 1,09 points for operations for the dialogue between parts, 3,26 and 0,74 points for platform feeding operations, 5,00 and 0,00 points for operations of direct affection or decision making and 5,00 and 3,54 for follow-up operations. In the Abbreviated Selection modality, the difference between the entities and the suppliers, respectively, is 0,57 and 0,43 points of operations for obtaining of information, 1,25 and 0,75 points for mobility operations in the system, 1,80 and 1,20 points for operations for the dialogue between parts, 3,24 and 0,76 points for platform feeding operations, 5,00 and 0,00 points for operations of direct affection or decision making and 5,00 and 3,60 for follow-up operations.

Figure 17. *Dimensions of Forms of Action*





Source: self-made

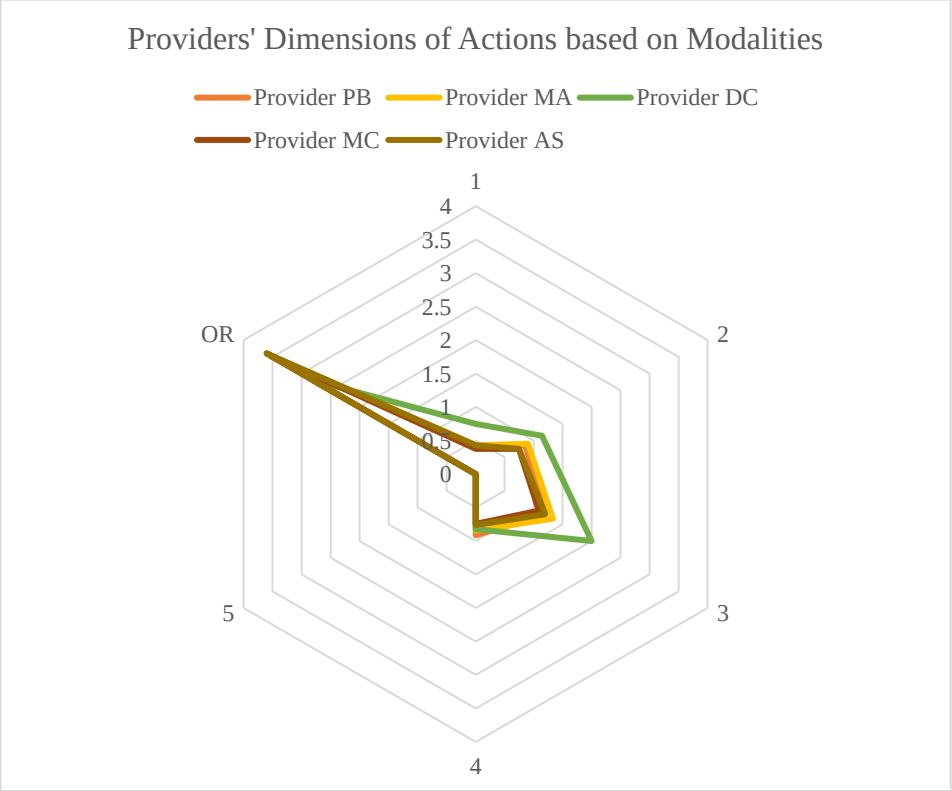
The area of each pentagon is the level of relevance and involvement of the process by each of the angles of action. Both for suppliers and for the plaintiff entities that carry out the contractual management processes, this graph relates the dimension that allows to visualize how big the affectation is by these actors according to the different forms of actions of each role. Also, each pentagon varies the angle of its vertices according to the action of a certain actor with respect to the different modalities considered in this case.

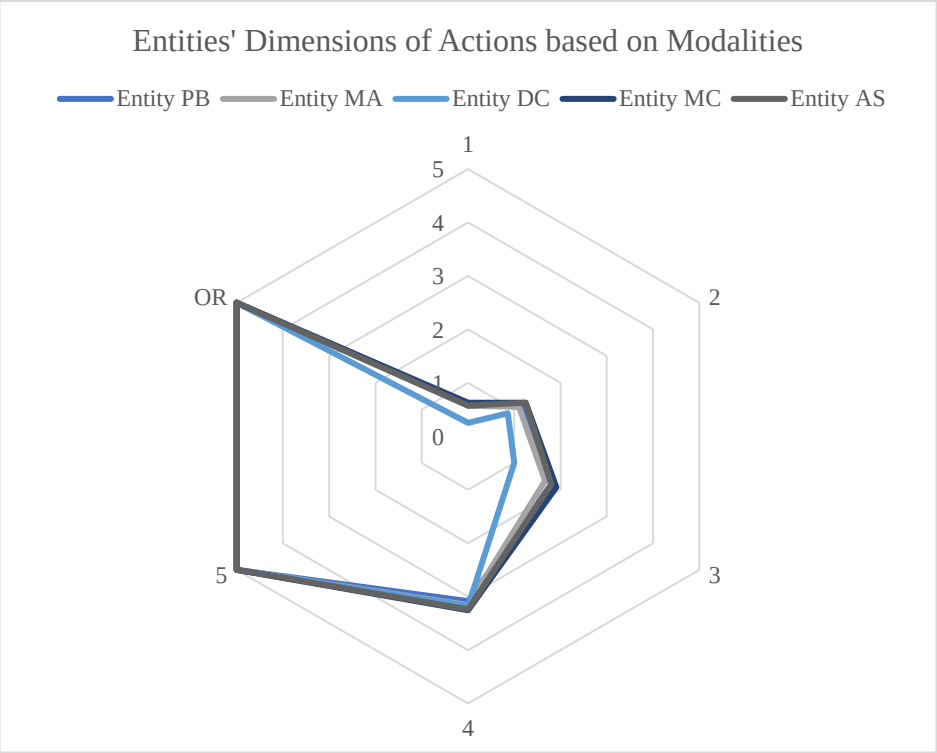
Both for the forms of action of the purchasing entities and for the forms of action of the suppliers, different traceability dimensions are perceived. In general, the purchasing entities have a greater spectrum of action, especially considering the observation and the capacity of direct manipulation of the process, since it shows a perfect pentagon where its angles are not affected by a smaller spectrum of action. While on the contrary it is possible to observe that for the provider even the observation as a form of action within the process is not complete, and a diminished dimension is seen in its other forms of action.

5.2.2. Relation Between Entities and Providers

Traceability is different for each participant in the process, because each actor participates with a dynamic relationship different from the other actors. In this case the dimensions acquire their form according to the capacity of action of each one of the actors in each one of the different modalities of contracting.

Figure 18. *Dimensions of Actions based on Modalities*





Source: self-made

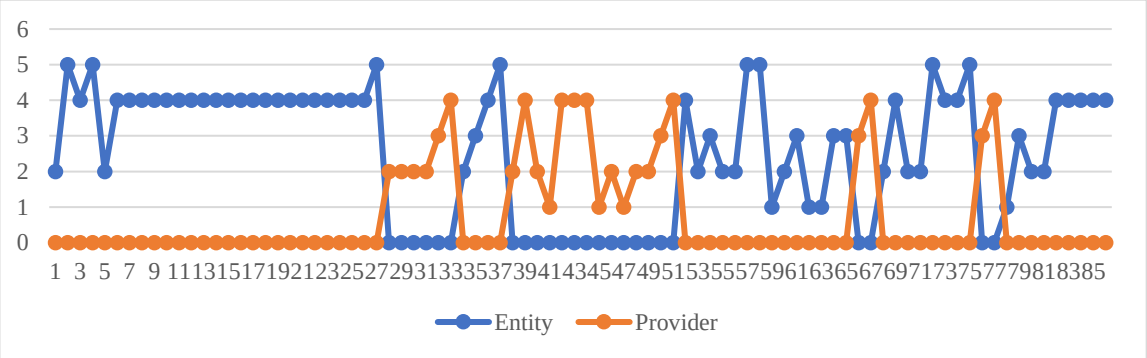
It is important to consider that in this particular figure, the dimensions are not expanded in function of the different forms of action and the capacity of each actor to carry out these forms; in this case, it is based on the fact that each actor performs his actions, but the actions are limited for each actor depending on the capacity of action within each modality.

Now, in this figure it is possible to understand the difference in the capacity of action and stroke of each one of the actors. Definitely the field of action and traceability is much greater for the entities that have legal, structural and practical control over the contracting processes. It is also possible to deduce from this last figure that both dimensions tend to a more complete and relational approach in terms of observation, which also in one way or another brings both actors to a minimum right about the process, considering themselves also as a auditorium or receiver of information that not so actively also has a functional role for the process that must also be observed, thus guaranteeing other basic considerations of public management, such as transparency and permanent visibility of the actions administrative.

a. Public Biding

For the Public Biding modality, the majority of the actions developed by each one of the actors is given in a linear manner and not simultaneously. As in all contracting modalities, the management of the process is initiated and finalized by the purchasing entity. After the opening of the process by the entity generates a kind of dialogue where the actors take turns to develop with a particular role one or another activity. In this modality a total of 86 activities are developed in which the actions that are carried out actively by one or another actor are reflected in the peaks of the figure. The suppliers in this process are maintained with 5 valleys and 4 different peak frequencies. The entities in this process have 4 valleys and 5 peak frequencies.

Figure 19. *Public Biding Modality, Relation Flow Between Entities and Providers*

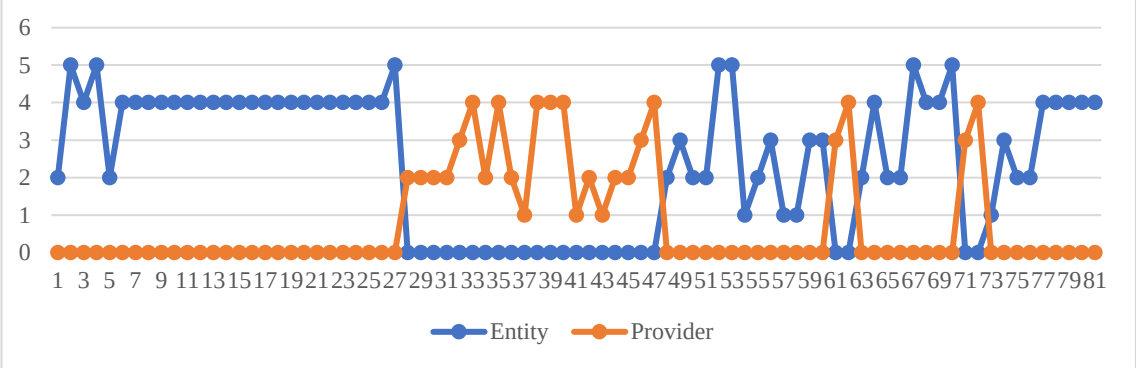


Source: self-made

b. Minimum Amount

For the Minimum Amount modality, the majority of the actions developed by each one of the actors is given in a linear manner and not simultaneously. As in all contracting modalities, the management of the process is initiated and finalized by the purchasing entity. After the opening of the process by the entity generates a kind of dialogue where the actors take turns to develop with a particular role one or another activity. In this modality a total of 81 activities are developed in which the actions that are carried out actively by one or another actor are reflected in the peaks of the figure. The suppliers in this process are maintained with 4 valleys and 3 different peak frequencies. The entities in this process have 3 valleys and 4 peak frequencies.

Figure 20. *Minimum Amount Modality, Relation Flow Between Entities and Providers*

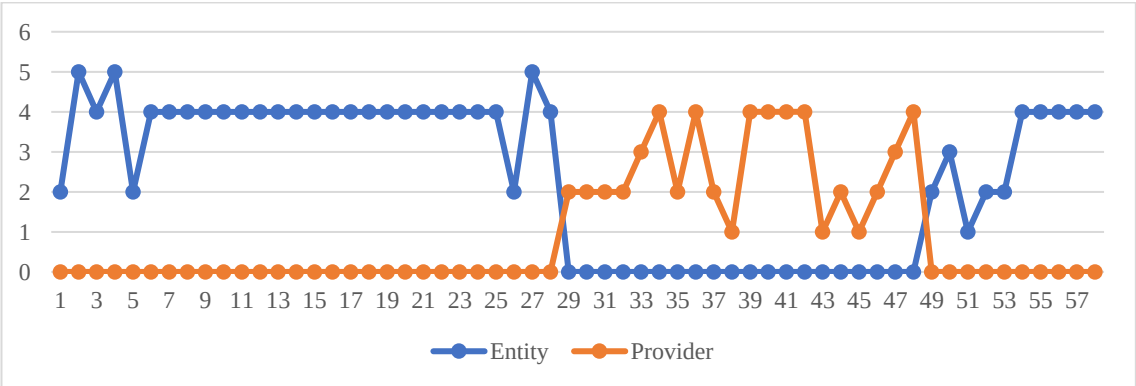


Source: self-made

c. Direct Contracting

For the Direct Contracting modality, the majority of the actions developed by each one of the actors is given in a linear manner and not simultaneously. As in all contracting modalities, the management of the process is initiated and finalized by the purchasing entity. After the opening of the process by the entity generates a kind of dialogue where the actors take turns to develop with a particular role one or another activity. In this modality a total of 58 activities are developed in which the actions that are carried out actively by one or another actor are reflected in the peaks of the figure. The suppliers in this process are maintained with 2 valleys and 1 peak frequency. The entities in this process have 1 valley and 2 peak frequencies.

Figure 21. *Direct Contracting Modality, Relation Flow Between Entities and Providers*

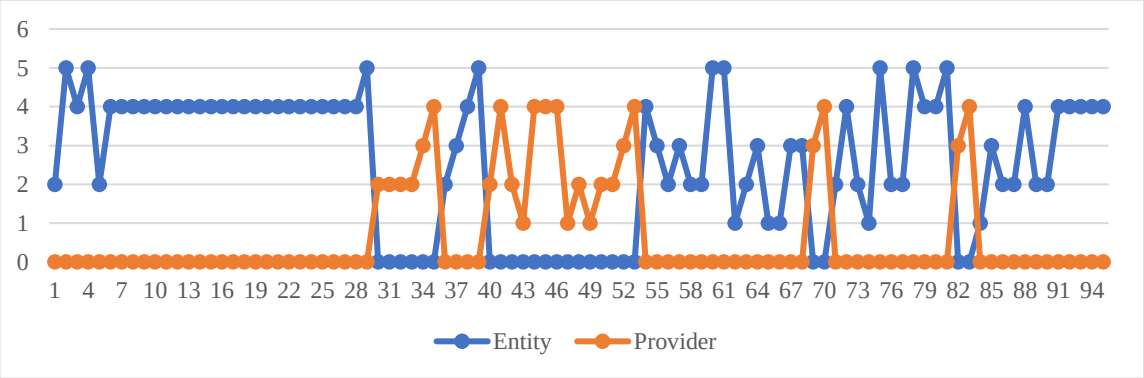


Source: self-made

d. Merit Contest

For the Merit Contest modality, the majority of the actions developed by each one of the actors is given in a linear manner and not simultaneously. As in all contracting modalities, the management of the process is initiated and finalized by the purchasing entity. After the opening of the process by the entity generates a kind of dialogue where the actors take turns to develop with a particular role one or another activity. In this modality a total of 95 activities are developed in which the actions that are carried out actively by one or another actor are reflected in the peaks of the figure. The suppliers in this process are maintained with 5 valleys and 4 different peak frequencies. The entities in this process have 4 valleys and 5 peak frequencies.

Figure 22. *Merit Contest Modality, Relation Flow Between Entities and Providers*

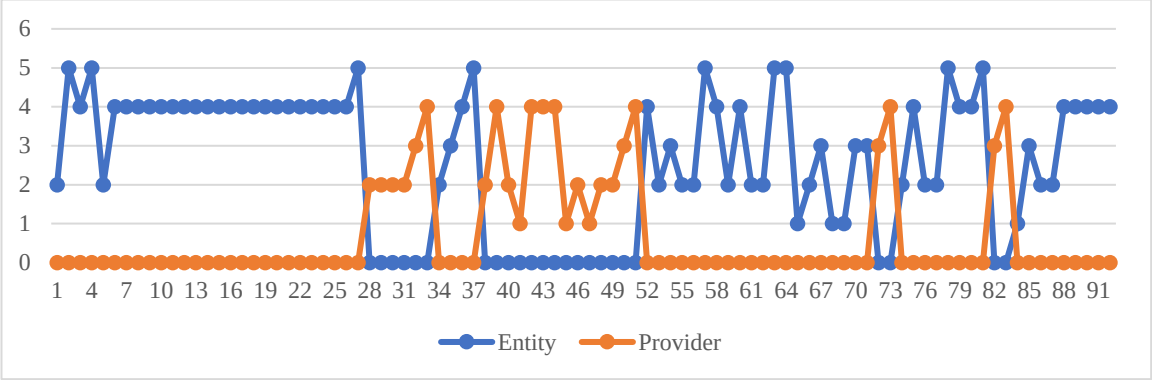


Source: self-made

e. Abbreviated Selection

For the Abbreviated Selection modality, the majority of the actions developed by each one of the actors is given in a linear manner and not simultaneously. As in all contracting modalities, the management of the process is initiated and finalized by the purchasing entity. After the opening of the process by the entity generates a kind of dialogue where the actors take turns to develop with a particular role one or another activity. In this modality a total of 92 activities are developed in which the actions that are carried out actively by one or another actor are reflected in the peaks of the figure. The suppliers in this process are maintained with 5 valleys and 4 different peak frequencies. The entities in this process have 4 valleys and 5 peak frequencies.

Figure 23. *Abbreviated Selection Modality, Relation Flow Between Entities and Providers*

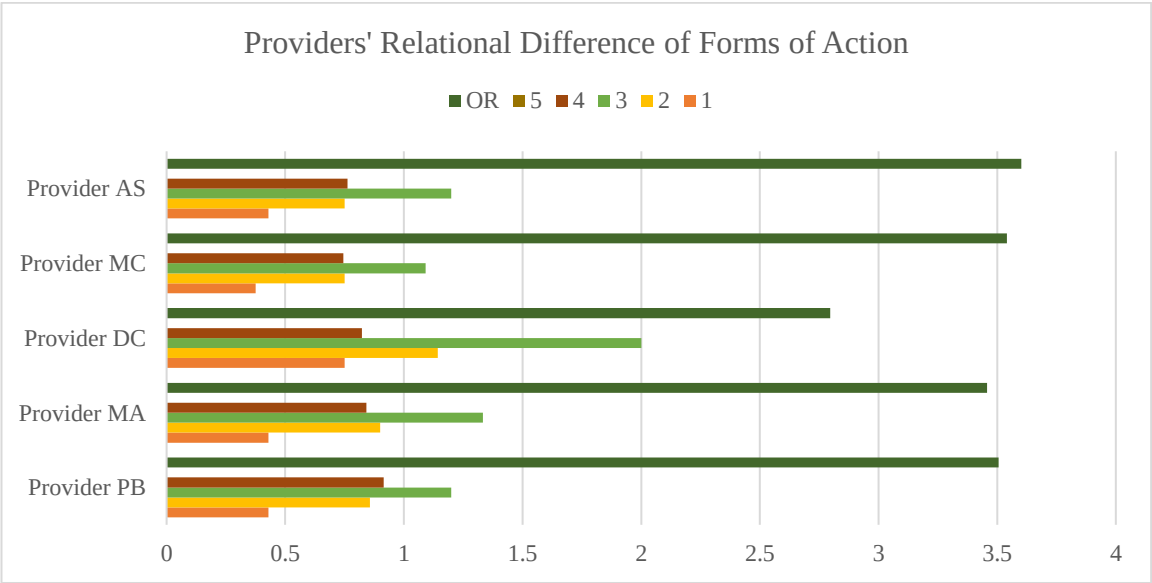


Source: self-made

5.2.3. Contracting Modalities

For each of the actors, the modalities are executed differently, and also based on the way to proceed within each modality, levels and traceability mechanisms for suppliers and contracting entities vary definitively. Each actor, according to their opportunity of action within each modality, perceives the traceability within the process in a different way. Not in all the processes the same traceability is perceived.

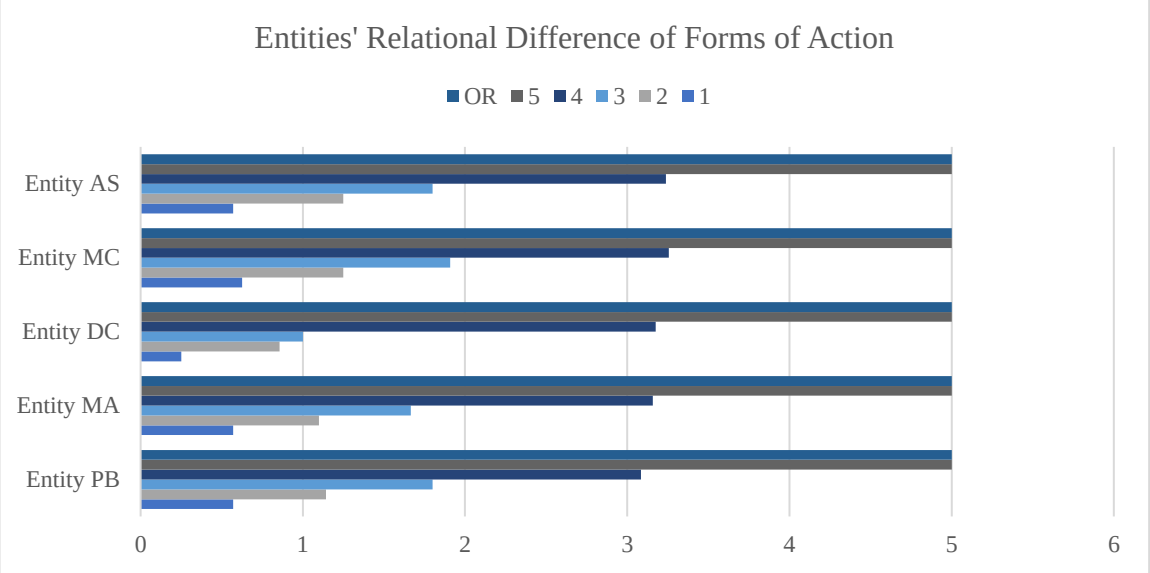
Figure 24. *Providers' Relational Difference of Forms of Action*



Source: self-made

For suppliers, in each of the different modalities of contracting management in the SECOP online recruitment system, the relational difference of the forms of action carried out within the same process, have a maximum level of tracing in consideration with the possibility of observation, achieving a maximum score of about 3.5 maximum. the other forms of action fail to exceed 2 points, and most of these are below a point.

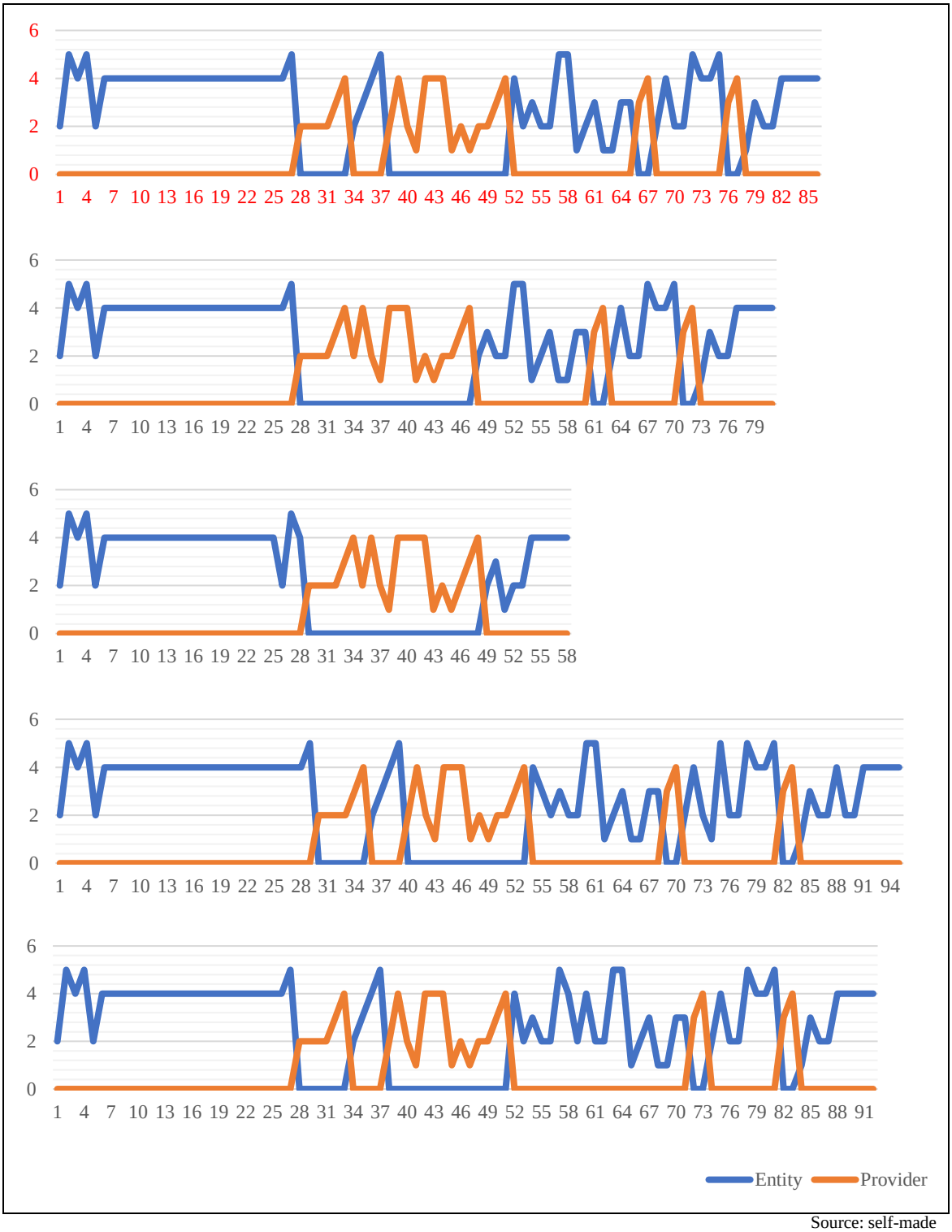
Figure 25. *Entities' Relational Difference of Forms of Action*



Source: self-made

For the entities, the relational difference of the forms of action carried out within the same process, have levels of action that are carried out proportionally based on the relationship they carry out with suppliers. It can be said that each of the actions reaches a maximum score in an escalated manner, which guarantees that the actions carried out cover each of the procedures and reach a harmonic traceability of the processes in their entirety. A first form of action is below a point, but the following form of action, according to its affect within the process, oscillates between one and two points, while the following activities are about 3, 4 and 5 points respectively, based on the degree of affectability of the outline of the process.

Figure 26. *Contracting Modalities Relation Flow Comparison*



Source: self-made

In figure 26 it is possible to show the difference of the stroke flows in each of the modalities and the way in which each of the actors does not have a particular pulsing

within each of the modalities. The latter figure summarizes in general terms the question within this document, within which it was intended to understand the term of traceability in relation to online public contracting, executed within the SECOP II online system, where in turn the analysis of said concept allows the relational analysis of two parts within the same process.

Although they are processes with a same objective, the fact that within each modality different procedures are executed, in fact, it varies in a certain percentage the trace made by each one of the parties that participate in the process. Each action within a process responds systematically to its final objective, which in turn means that the trace does not only varies depending on the proposed objectives but also the mechanisms and procedures proposed to achieve that objective. It is evident that traceability as a monitoring and monitoring mechanism linked to obtaining ordering and information management allows a greater number of possibilities beyond the basic objectives of each process.

6. CONCLUSIONS

Below are listed the conclusions that can be addressed after the analysis performed in this work. The main points of this document are outlined, which allow to articulate the research carried out with the obtained findings. Likewise, later are presented the summary of this work, the practical implications of this analysis, the study limitations and the suggestions for a further research.

As mentioned, the evolution of public contracting in Colombia has allowed a substantial change of perspective and approach in relation to the role of contracting within the state apparatus. In the first normative and regulatory sketches of the processes for the procurement and hiring management in Colombia, this was considered as a simple support practice, far from the missionary objectives of the public administration. In recent years, the recruitment tends to be understood more than as a support process, as a strategic process that enables the fulfilment of objectives and that also allows these objectives to be carried out under fundamental principles of public management such as transparency, efficiency and effectiveness.

These last elements are fundamental criteria for the execution of any type of activity and administrative practice. Along with these, the analysis performed previously showed that traceability also emerges as an attribute that allows, rather than observing and monitoring a process, to capture, organize and manage information for a more objective and objective view of a particular process.

In Colombia, the analysis of this attribute is perceived more closely, due to the study of systematic mechanisms. Information technologies and the growth of the networked society have allowed countless possibilities to optimize the relations and interactions between the members of society and government institutions. Today in Colombia there is an online system, SECOP II, within which is being developed the management of contractual processes. This system makes visible substantially the relationship that exists between the entities buyers and suppliers that offer their goods and services to the state.

Regarding the main research questions, it can be stated that considering the buying entities and suppliers relation within online public procurement processes in Colombia, the traceability in contracting modalities always presents a substantial change. Traceability when contemplating each of the tasks within the process, results in a different total value from one modality to another, since each modality is executed although in a similar way with variances in the number and order of tasks.

With regard to the general research questions, it can be stated that online public procurement processes in Colombia has been established based on the constant need to strengthen contracting mechanisms, leading the Colombian state to consider public contracting as a management strategy, going from being a support process to a strategic process; in this way, an entire service and information platform is designed within the framework of online governance. In this process the factors that define the traceability through the relation between entities and suppliers in the online procurement system are each one of the forms of action, mechanisms of intervention and levels of impact within the process. The elements that enable the traceability in this platform are the possibility that each one of the actors must follow up, observe and control the stages and components of the procedures. Thereby, traceability varies dynamically and proportionally between each of the contracting modalities, showing the action flow and the comparative spectrum between the purchasing entities and the bidders.

After defining the way in which traceability could be observed within the processes defined for online contracting in Colombia, it was found that, according to the objectives on which these processes are structured, there are contracting mobilities that differentiate the form of relationship between buyers and suppliers. Finally, it was corroborated that the contracting modality varies the traceability rate of the purchasing entities and suppliers within online public procurement processes in Colombia.

Also, after the study carried out with the proposed methodology it was observed that, the analysis of processes is the structural basis for a rigorous traceability of the process. Traceability, as well as transparency, is an added value for the execution of processes in the public administration, which not only provides all kinds of information for the process

optimization, but also allows to understand the dynamics of the constituent elements of the processes and to see at another level the extra trans and multi procedural scopes of these.

6.1. RESEARCH SUMMARY

The evolution of public contracting in Colombia has allowed a substantial change of perspective and approach in relation to the role of contracting within the state apparatus. In recent years, the hiring process tends to be understood as a strategy that enables the fulfilment of objectives and that also allows these objectives to be carried out under fundamental principles of public management such as transparency, efficiency and effectiveness. The networked society open countless possibilities to optimize the relations and interactions between the members of society and government institutions, it is so in Colombia has been developed the online procurement process SECOP II for the management of contracting processes. Within this system, based on the mapping process analysis methodology has been studied the existing relationship between the purchasing entities and the suppliers within the contractual management process, in order to understand the concept of traceability not only as a monitoring and observation tool, but also as an instrument to obtain, organize and manage information. Traceability is, as well as transparency, an added value for the execution of processes in the public administration, which provides all kinds of data for the process optimization.

6.2. PRACTICAL IMPLICATIONS

The practical implications of this work are not only present in the opportunity of analysis within the SECOP II online contracting system, but also in all kinds of missionary and support processes in any entity and institution. On the one hand, it is possible to understand the online recruitment process in Colombia in greater depth, in order to be able to make models that optimize the procedures to be executed. Also, the parties involved in the process can demand a much more dynamic type of relationship, which is not based on a linear practice; the use of technology enables multidirectional communication channels.

The new technologies and the networked society facilitate the collection of data simultaneously and automatically as certain specific activities are developed. As long as more information is obtained, which can also be presented graphically and dynamically, greater is the number of possibilities to analyse this information and potentially generate actions that respond to social demands in a timely manner.

6.3. LIMITATIONS OF THE STUDY

One of the biggest limitations of this study is that the analysis of the process is based on official documents that allow observing the way in which the execution of these processes has been documented, but in practice there are other points to be considered that are not have taken into account for this document. Also, only the relationship between purchasing entities and suppliers has been considered, but the role of citizens within this framework has been excluded.

The contracting modalities enunciated in the present work are basic standards of contracting in Colombia, but according to each entity and based on the contractual object, these modalities may vary. It is based on the assertion that there are five modalities of hiring, but there are no other sub modalities that arise from the taking of elements of one and another modality depending on the final contractual objective in the different state institutions.

6.4. SUGGESTIONS FOR FURTHER RESEARCH

For a further investigation, it is suggested that other actors, such as citizenship, be considered within the processes under study. It is also possible to analyse existing relationships not only within the SECOP II online system but also in the other online platforms offered by the Colombian government for the management of contractual and administrative processes in the country.

After obtaining the results of this document based on the existing documentation for the online execution of these processes, we could also observe the real practice and analogy that is still present, in order to compare certain points in common between both contractual management mechanisms. There are elements that complicate the relationship between entities and suppliers that are only observable through a field study.

On the other hand, beyond the online platforms of the entity promoting online contracting in Colombia, *Colombia Compra Eficiente*, could be possible to explore other management strategies that are being carried out, which stimulate in terms of network relationships, the points of encounter, communication and interaction of entities that purchase goods and services in Colombia.

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