DEPARTMENT
OF BUSINESS SCIENCES
MANAGEMENT
& INNOVATION SYSTEMS

UNIVERSITY OF SALERNO

Department of Business Sciences

Management & Innovation Systems

(DISA – MIS)

Ph.D. Course
Management & Information Technology

Curriculum
Economics and Management of Public Companies

Open Government Data to improve Public Service Quality: an empirical validation through a Structural Equation Model

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Academic Year 2017/2018

A mia MADRE.

Per l'Amore e la Forza.

Per il Coraggio, invisibile. E per la Fiducia.

Per la Pazienza, il Supporto e per l'Orgoglio.

Per i suoi Sacrifici, silenziosi.

To my MOTHER.

For Love and Strength.

For Courage, invisible. And for Trust.

For Patience, Support and Pride.

For her Sacrifices, silent.

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Introduction

The deep changes that have increasingly characterized and keep on influencing the public sector push administrations towards the adoption of flexible and adaptable management models (Ashworth and Kavaratzis, 2018). Currently, the notable relevance recognized to the quality of public service in all economic, political and social contexts is shifting the attention of scholars and practitioners towards the development and deepening of new concepts of productivity, sustainability and survival (Durant and Durant, 2017).

In fact, the everyday activity of every social actor seems to be characterized by the continuous search for an improvement in the performance and level of quality of the public service. All this ends up influencing the assessments, judgments and perceptions of everything concerning the concept of public service quality, affecting the actions of those who, for various reasons, are involved in the management and governance of the Public Administration (McNabb, 2015).

In this direction, there seems to be a real cultural evolution, to which different strands of research are gradually associated, paying attention to the concept of public service quality and to the importance of underlining the need to reach the adoption of management and governance models strongly oriented towards transparency, collaboration and participation of public service users (Peters and Pierre, 2016).

This shifting approach to the management and governance of public administrations has progressively led scholars and managers towards the analysis and preparation of advanced models, capable of overcoming the limits linked to the excessive rigidity and bureaucracy of traditional forms of public management and governance (Van Thiel, 2014).

Over the years, numerous studies have been conducting to highlight the logical and chronological passage that has marked the evolution of management models for public administrations (Meier, 2015; Liu and Yuan, 2015; Ni et al., 2017; Kiel, 2014). However, all the knowledge in this regard seems to be still particularly fragmentary and difficult to systematize: in literature, to date, there is no organic nucleus of empirical research aimed at investigating the factors stimulating a better perception of public service quality throughout the implementation of the several approach in the public administrations. Probably, this is due to the complexity reached in the attempt to analyze and adequately interpret the dynamics influencing the performance of public sector organizations.

Furthermore, most of the scientific contributions dedicated to the theme of public service quality are based on considerations deriving from mostly theoretical analyzes, carried out on the basis of verified hypotheses by recalling theories and paradigms lacking empirical evidence.

In this scenario, the thesis aims to provide a reinterpretation of the management models of public administrations, with the purpose of identifying a set of variables

on which managers and policy makers could opportunely leverage to promote better perception of the public service quality provided to citizens-users.

Specifically, the thesis focuses on the concept of Open Government Data (OGD) as a new approach to the management of public administrations (Pereira et al., 2017; Wang and Lo, 2016; Zuiderwijk and Janssen, 2014; Attard et al., 2015; Chan, 2013), based on the use of technologies for data treatment capable of favoring the affirmation of logics characterized by transparency, citizens' participation and collaboration in the processes, activities and services of the public sector (Dawes et al., 2016; Gonzalez-Zapata and Heeks, 2015; Ubaldi, 2013; Shadbolt et al., 2012). In particular, the objective of the work is to deepen the aspects and conditions enabling the management of Public Administration (PA) according to the OGD, as well as the impact of this approach on the public service quality perceived by the community.

To achieve the research objective stated above, in addition to the introduction, the thesis is structured into four chapters, followed by the conclusion.

The first chapter is devoted to the literature review on the management of public administrations. More in detail, in the first chapter the main models used over the years for the management of public administrations are divided into three main macro-categories: the traditional approaches, the new paradigms and the models of the Service era. The main management models included in the category of traditional approaches include: the Bureaucratic Model; the New Public

Management; the Jones and Thompson's 5R Model; and the Public Governance. The new paradigms include: the New Public Governance; the Network Governance; and the New Public Administration. With regard to the Service era, two approaches are examined: the New Public Service and the Public Value Management.

The second chapter focuses on the evolution that led to the birth and progressive establishment of the Open Government Data. To this end, several aspects are debated to highlight how the dissemination of this approach to the management of public administrations has occurred. In particular, attention is payed to the digital transformation of the public sector, on the role played by ICTs and other digital tools the PA, on E-Government and multi-channel concepts and on the main dimensions of Open Government Data: Transparency; Participation and Collaboration.

The third chapter describes the methodology used to carry out the empirical analysis: Structural Equation Modeling. It opens with the specification of the notion of social research methodology, placing emphasis on the opportunities and threats of the quantitative approach. Subsequently the requirements to evaluate the reliability, internal consistency and validity of the measurement scales are discussed. The chapter continues with the specification and estimation of the measurement model and the structural model. Finally, the convergent validity and the discriminating validity of the latent variables are debated.

The fourth and last chapter is dedicated to the technique of data collection and analysis conducted to achieve the research objectives. First, the research design is defined, the hypotheses of the model are formulated, the sampling and questionnaire development are explained, the data collection and elaboration are described, the findings are highlighted and subsequently discussed, the theoretical and practical implications are debated, with regard to both theoretical advancement and managerial insights.

In conclusion, wide space is dedicated to a synthesis reflection to underline the value and originality of the thesis, as well as its limits of the work on the basis of which ideas for future research are proposed, especially in consideration of the fact that the work takes shape as a first step for a subsequent scientific development, to be carried out possibly by using other complementary analytical techniques and by extending the space-time scope of analysis in order to make comparisons capable of highlighting similarities and differences aimed at underlining the robustness and generalizability of the results obtained and of the related implications.

Chapter I

Management of public administrations:

from the Bureaucratic Model to the New Public Service

1.1 Traditional approaches; **1.1.1** Bureaucratic Model; **1.1.2** New Public Management; **1.1.3** The Jones and Thompson's 5R Model; **1.1.4** Public Governance; **1.1.5** Network Governance; **1.1.6** New Public Administration; **1.2** Service era: service-oriented management paradigms; **1.2.1** A new concept of service; **1.2.2** The advent of the Service Economy; **1.2.3** Public Value Management; **1.2.4** New Public Service.

1.1 Traditional approaches

Every organized human society needs rules and procedures to work and fulfill its functions. This need is even more evident in central and local public bodies, underlining the nature of the PA as an instrumental activity for the management and governance of public institutions (Antonelli, 2000, 1997). The concept of Public Administration includes all central organizations, social security institutions and local bodies. These are essentially administrations that produce goods and services not intended for sale, whose main function consists in managing and governing public and private activities.

These activities give rise to the administrative function, that is, to the set of methods used by the administration, oriented towards the pursuit of a specific

purpose. In public administrations the instrumentality of the administrative activity was initially opposed, to be then recognized only in more recent years. In fact, the factors that have contributed to the emergence of administrative systems are two (Mayntz, 1978):

- the concentration of power within a specific and delimited territory;
- the presence of objectives requiring the collaboration of a plurality of individuals.

1.1.1 Bureaucratic Model

The situation described above has led to the consolidation of principles with a strong institutional content, reflected in the model of bureaucratic government (Borgonovi, 2005). The bureaucracy was born as a sort of operational arm for the pursuit of the goals of public administrations. It has represented the most typical organizational phenomenon of modern society which has placed the process of bureaucratization in close connection with the rationalization, within the broader process of modernization.

The moment of maximum expansion of the Bureaucratic Model took place within the Enlightenment culture, where the main emphasis was focused on the paradigms of absolute rationality, perfect symmetry of knowledge and transparency.

The first social scientist who exhaustively analyzed the concept of administration is Max Weber, who framed the bureaucracy in the process of rationalization that has affected the history of the West (Mayntz, 1978).

Max Weber and his followers have associated the analysis of the Bureaucratic Model to the development of legitimate power and its various manifestations in

charismatic, traditional and legal-rational power. What distinguishes the three types of power proposed in the Weberian conception is the criterion on which the claim of legitimacy of power is founded, which can come:

- from the belief in the skills and personal charisma of those are in power (charismatic character);
- from belief in the sacred character, from the rightness of tradition and from the legitimacy of those who are called to exert power (traditional character);
- from the belief in the legality of a system of impersonal legal orders (rules and procedures) and the right of command of those who are called to exert power on the basis of laws (legal power).

The practical exercise of power requires the presence of an administrative apparatus that acts as a "trait d'union" between holders of power and recipients. According to Weber, the administrative apparatus of legal-rational power is the bureaucracy, which is characterized for the aspects linked to the organizational structure and function, to the means by which workers are rewarded and to the benefits of the individuals employed in the organization. The most characterizing element of the Bureaucratic Model is the assumption that the rationality of the logical system allows for the control of the quality of results and processes.

However, the same scholars who have theorized it show that it is an abstract model of reference to which public and private organizations should tend. In fact, the reality within which organizations operate is very different from ideal models and, on the other hand, the subjectivity of the person can only be contained but not completely eliminated. According to the Weberian conception, the more unpredictable, uncontrollable and non-judicial component of subjectivity is contained, the more the space destined for the rationality of the social organization grows.

Therefore, according to Weber and his supporters, to make the activities of organizations efficient and effective, it is necessary to control the organizational structure through rules and procedures that allow predicting the workers' behavior. Weber emphasized the importance of the Bureaucratic Model by arguing that the achievement of the set goals is simpler whether the arbitrariness and opportunities for conflict in interpersonal and social group relationships are eliminated.

The German sociologist believed that the business purposes should be pre-established by the law and by the rigid use of the rules (prescriptive legislation). The plurality of specialized roles requires, however, strong coordination structures that constitute the premise of the hierarchy, which increases proportionally to the dimensional growth of the organization.

The Bureaucratic Model played an important role especially in the first phase of the development of modern enterprise, giving particular emphasis to aspects related to the specialization of work, as well as reducingthe importance of relations between tasks, functions and final results of processes. In this model the decision-making area is managed only by the top management, while the middle management is entrusted with control of the precise execution of the tasks to be performed by the executive staff, verifying the strict compliance with the procedures.

Weber (1964) does not define the bureaucracy but, rather, tries to identify its main characteristics that make it the most efficient form of administration. In the Weberian conception, organizations and enterprises are characterized by:

- a hierarchical principle, according to which every manager answers to his/her superior for all the decisions taken by him and his/her subalterns;
- a formal system of stable rules and regulations aimed at ensuring the achievement of uniformity of actions and decisions;

- a division of labor (responsibilities or duties of the office) and a high level of specialization, making use of people with the required technical qualification. In fact, to each office an area of competence and responsibilities is assigned but the deriving power belongs to the office and not the person to whom it has been entrusted;
- impersonality in external and internal relations, which avoids the interference of feelings in the rational fulfillment of official duties;
- a vision of work both as a profession and as a career. Many bureaucratic offices provide lifelong employment and this translates for the official into a certain level of job security and increasing salary through automatic promotion procedures based on merit and seniority.

The characteristics described above make possible to identify the pillars of the Bureaucratic Model in the following elements: rationality, neutrality, hierarchy and competence. Rationality implies that the bureaucrats put into practice the rules coming from the political decision-makers according to a rational method that satisfies decisions; neutrality shows how the bureaucracy is disconnected from other powers, such as the political one, because the task is to produce impersonal rules valid for the reference subjects; the hierarchy, on the other hand, makes possible to highlight how bureaucracy is organized in a way that enables each position to be higher or lower than another one (vertical model); finally, competence reinforces the bureaucracy thanks to its specialized knowledge.
The bureaucrats are part of it because they demonstrate to know, through certain procedures, that knowledge. Therefore, the Bureaucratic Model promoted and supported by Weber identifies a strong link between power and administration. In fact, if on the one hand power is manifested and acts as administration, on the other hand every administration requires power. The existence of an administrative apparatus is consequently one of the factors most intimately

connected to power relations. The other factor linked to power is legitimacy, since every power tends to arouse and cultivate faith in its own legitimacy.
The growth and evolution of this model are dependent on several factors, such as: the affirmation of the monetary economy; the pressures deriving from the various social groups with the affirmation of democracy; the static environment; the pushes coming from the bureaucrats; the specialization of administrative bodies.

The combination of these factors has determined and implemented the model that for years has represented the modus operandi of public sector organizations and in which the following characteristics are defined: elementary technologies and simple/basic decisions.

In such a model, the manager mainly uses authority and control. In other words, uniqueness comes to delineate both in terms of command and authority. In fact, the manager, also called "boss" has the authority, responsibility, control of the activities carried out by employees and holds complete knowledge. The "boss", in other words, is responsible for the objectives and results, imposes his/her own decisions and monitors the operations performed. According to Weber (1964) the "boss" thinks, knows and decides, while the employee obeys since he/she has to do the "things" by who has authority.

Therefore, in the bureaucratic decision structure, employees are subject to stringent top-down control. Therefore, in the Weberian conception, the Bureaucratic Model was considered as the most efficient and effective form of public institutions management since it was based on the possibility of reducing the discretion of people, referring only to compliance with formalized and pre-established procedures.

The theories formulated by the German sociologist were later taken up by other scholars. In fact, until the end of the 80s the public sector was organized and managed according to the characteristics of the traditional Bureaucratic Model

(Weber, 1980), founded on a vision of the public institute that correlated the nature of public action almost exclusively to the respect formal legality and the presence of guarantees aimed at preventing negative behavior with respect to public purposes, rather than promoting proactive behavior (Borgonovi, 2002).

In that context, where the efficiency and effectiveness of the activity would have been theoretically guaranteed through the correct and timely execution of the tasks to be carried out in an impartial and neutral manner, it becomes clear that the crucial competences were those related to the respect of legality, the meticulous knowledge of legislation and procedures, as well as the possession of a high specialization on individual aspects. Some of these characteristics have remained as acquired in the modus operandi of PA but, with the entry into crisis of the Bureaucratic Model, other scholars highlight its limits theorized by the German sociologist and his followers.

However, over the years, Weber's conceptual approach has been criticized. In fact, several scholars have stated that the German author and his followers had omitted to consider two particularly relevant aspects: the opportunism that often characterizes human action and the limitation of information held by those called to control compliance with procedures and management rules (Brosio, 1996).

According to a similar consideration, Merton (1970) in saying that "... chickens are trained to recognize in the sound of a bell the signal of announcement of food but this sound can be used, in a second moment, to attract and kill them...", emphasized how sometimes the respect slavish rules, under certain conditions, could prove dysfunctional in relation both to the pursuit of the proposed goals and to whom the bureaucracy should serve.

According to Merton, the absence of ductility, in occasion of changed environmental conditions, determines an inability to adapt and therefore an unproductive fossilization to the mere respect of procedures and rules. It follows

that adherence to the rules seen first as a means, then becomes an end in itself, transforming the structural value into the final value. All this translates into inability to adapt, rigidity, fussiness, technicality, hindering the purpose and purpose of the organization. In fact, the bureaucrat who is increasingly oriented towards compliance with discipline and rules places too much emphasis on regulations, generating uncertainty in decisions, a conservative mentality and accentuated technicality. Moreover, in order to defend their status, which is based on full compliance with rules and procedures, officials tend to hinder any change in practice that could compromise or harm their interests.

This explains why many regulations, originally introduced for technical reasons, tend to become rigid and sacred even when they are obsolete. This trend also leads to a certain depersonalisation of the relationship between civil servants and users, as problem-solving officials minimise personal relationships, always trying to address issues in the same way, categorising users abruptly.

Other scholars focus on the dualism between hierarchical discipline and professional competence, supporting the existence of a plurality of models represented by different types of democracy: apparent, impositive and representative (Gouldner, 1954). In apparent democracy, the rules are determined by an external structure and are ignored by both managers and employees; in the tax system, on the other hand, one party decides the rules with respect to the others and, finally, in the representative model, the rules are shared, that is, determined by the managers with the participation of the other parties.

Other scholars argue that the increase in specialisation, proper to the bureaucratic model and to the delegation and independence given to experts, can lead to the emergence of sub-groups whose objectives may differ from those of the organization (Selznick, 1966). Selznick's studies and analyses led to results that were mirrored in a series of considerations:

- the existence in formal organisations of forces built to pursue certain aims;

- the organization has to meet some basic needs in order to survive;

- the adaptation of the organisation has to be seen in terms of the needs to be met;

- the organization has to be seen in a twofold direction, both as a fundamental tool for the pursuit of an objective and as an element that deforms the objective to which it tends.

In the light of these considerations, Selznick goes so far as to support the ambivalent nature of the institution, where at the upper level there is the organization, as a tool designed to perform a job, and at the lower level there is the institution, closer to the needs of society.

In the literature of organizations, the bureaucratic model has been criticized for the lack of attention paid to the non-formal component, highlighting the excessive importance given to form, rather than substance (Crozier, 1969). In fact, the bureaucracy, being excessively formalistic, not only in the relationship with the users but also in the organizational criteria, ends up pursuing the only purpose of carrying out the tasks, with the consequence of putting in second place the competences and the subjective aspects. Argyris (1964) and his supporters state that bureaucracy reduces the psychological growth capacities of individuals causing feelings of frustration, failure and conflict, suggesting that the organization should leave sufficient individual responsibility, a certain degree of self-control, a work performance in line with the goals of the organization, productivity and an opportunity for individuals to fully apply their skills.

According to Caulkin's studies (1987), the impersonal structure of bureaucracy is considered as a form built more around the place than the person, in which the focus is placed more on processes than on objectives, thus determining a deviation between the activity of individuals and the objectives they are called to pursue. Therefore, numerous studies highlight the existence of certain limitations of bureaucratic management due to its different connotations. As for the rational Weberian method, the limits are:

- inability to choose appropriate means of achieving the objectives set: the bureaucrat is satisfied with the first most satisfactory solution (limited rationality);

- Inconsistent incrementalism: bureaucrats refer to some possible solutions and try them out until they find the most useful one;

- neo-institutionalism: organisations are not only functional apparatuses, but also holders of specific values and wishes (March and Olsen, 1997).

- asymmetrical political/bureaucratic relationship, according to which politics can live without bureaucracy but it is not worth the opposite;

- autonomy of the bureaucracy: out of the sphere of political influence, the bureaucracy not only carries out but plans and decides, placing itself in conditions of negotiation and no longer mere execution in the relations between the political and the social sphere in which citizens operate.

Bureaucracy also acts by subverting the hierarchical sphere. In fact, lower levels have often different tasks than higher levels with specific skills. The existence of these limits has gradually led scholars and experts to identify appropriate processes of reform of the Public Administration, recalling new concepts, opposed to those ones of the Weberian vision. Several elements of change in bureaucracy

have progressively emerged, such as deregulation (reduction of Public Administration rules leading to less present public intervention), privatisation (public space is reduced by giving more emphasis and importance to results) and transparency (citizens demand greater accessibility to documents, greater possibilities to interact with bureaucracy and greater control of efficiency).

1.1.2 New Public Management

At the end of the 1970s, economic and social changes prompted industrialised democracies to seek new ways of increasing competitiveness in the public sector, leading them to adopt the New Public Management (NPM) model (Gualmini, 2003). This reform movement has spread in the public administrations of various Countries and is characterized by the tendency to apply criteria for their management similar to those ones typical of private companies. Therefore, the expression "corporatization of public administrations" is used to define this reform process, which was also initiated in Italy in the 1990s, and which has brought the management methods of the "public thing" closer to those of private organizations (Pozzoli, 2009). It is not easy to define in detail the characteristics of the NPM, since there is no unitary body of theory from which it draws (Adinolfi, 2003). According to some authors, this current of thought represents "the third great revolution of the modern economy after the industrial and technological ones" (Hinna, 2009), to the development of which several international institutions (OECD, World Bank, IMD, World Economic Forum) have contributed effectively.

This innovative process starts from the negative and unsatisfactory results in terms of economic performance and services provided due to the rigid application of the bureaucratic model unsuitable to face the economic-social changes that

were progressively characterizing the Public Administration (Poggesi, 2006). The NPM can be qualified as a "pragmatic approach" based on very simple assumptions: the relaunch of the economic system requires high levels of efficiency and productivity of the public sector that can be achieved by introducing managers from the private sector, able to bring to the public sector culture, methods and techniques successfully tested in the private sector. The basic idea is to integrate the administrative law governing the operation of a public body with more result-oriented management methods with the aim of ensuring greater cost-effectiveness, efficiency and effectiveness in the management of public services.

A fundamental characteristic of the NPM is the application of managerial techniques, typical of private companies, in order to increase effectiveness and efficiency in the production of public services. The new paradigm emphasizes not the simple transfer to Public administrations of managerial logics and techniques traditionally employed in the private sector, but rather the principle according to which both public and private organizations must seek the best economic conditions to obtain higher quantitative and qualitative levels of results, given certain resources (Borgonovi, 1988). Therefore, the managerial function exercised within public companies is not merely oriented towards maximizing purely economic purposes but the search for better conditions for the execution of institutional functions through an efficient use of resources suitable to promote a physiological survival of institutions and Public Administration (Borgonovi, 1988).

This model is based on rational public management, a pervasiveness of value assumptions and an interest in maximising efficiency within the Public Administration (Girotti, 2007).

One of the main characteristics of the NPM is the great importance it attaches to the development of performance indicators for Public administrations that make it possible both to verify the results a posteriori and to provide stimuli for management that better correspond to the expectations of the communities of reference (Hood, 1995, pp. 95-98). Hood (1991, pp. 4-5) identifies seven elements to describe this paradigm: 1. the recognition of the professional character of Public Administration passes through the attribution to managers of greater responsibility and autonomy in the form of managerial skills; 2. the adoption by the Public Administration of parameters and indicators of evaluation of the activity in terms of quality and efficiency; 3. control of the outputs and services provided; 4. the tendency to disaggregate the operating units in the Public administrations; 5. the adoption of private-style management practices typical of companies that favour competition and competition with the private sector; 6. the use of parsimony in the allocation of resources; 7. the strengthening of self-regulation by public employees.

Osborne and Gabler (1992), argue that the Public Administration, in addition to leading, coordinating and providing services, must increase its internal competitiveness by focusing on performance. In addition, they believe that Public Administration should be modernised through the empowerment of managers and the recognition of the citizen as a client of a service provided by an entrepreneurial administration. In fact, according to the authors: "... the type of government that developed during the industrial era, with its centralized and slow bureaucracies, their attention to rules and regulations and their hierarchical structures, does not work very well ... They have achieved a lot in their day, but over time ... they have become superabundant, wasteful and ineffective. And when the world began to change they failed to change with it. ... The hierarchical, centralized bureaucracies designed in the 1930s and 1940s do not work well in the rapidly changing, information-rich, knowledge-intensive society and economy of the 1990s" (Osborne and Gabler 1992, p. 112). According to the authors, New

Public Management would propose itself as a single vision common to all countries, beyond the individual applications and administrative cultures, to overcome the current crisis.

The NPM represents a new way of studying and managing public organisations. Ferlie and Steane (2002) summarized with great effectiveness the essential aspects of the NPM with the trinomial: manager, market, measure, considering them the key principles of this model. Adcroft and Willis (2005, p. 387) stressed that an important aspect of this approach is the possibility of transferring successfully tested management techniques to other contexts in Public Administration management. Ferlie and Steane (2002) analyzed the reforms introduced in Europe, North America and Australia in the 1980s and 1990s in the spirit of New Public Management.

For Adinolfi (2005), the aim of the NPM "is not to study public organisations in a disinterested and detached way (as is the case in most social sciences) but to study them in such a way as to help operators find solutions to their problems or improve the functioning of the organisations they manage".

In this sense, new tools and structures have been introduced, the culture of management control and measurement of results has established itself, systems for evaluating managers have been implemented. In other words, we have witnessed an attempt to introduce, disseminate and root in the public sector corporate management criteria in the belief that the public sector can and "should" learn from the private sector, borrowing from the latter tools and operating logic that make it superior in terms of performance and performance.

Anselmi (2003, p. 168) pointed out that in Italy, too, in the 1980s, efforts were made to overcome the "traditional" bureaucratic model, in which the activity consisted mainly in the application of standards, towards management methods dedicated to the evaluation of results (performance management). In this

perspective, even the PA as a private company creates value when using resources in order to best meet the needs and requirements of potential customers. According to Moore and Khagram (2004, p. 5), the most important difference between private companies and Public administrations is that private companies obtain a large part of their financial resources from customers who voluntarily pay to purchase their products, while Public administrations obtain them mainly through the taxation decided by the legislative power. Other important differences are the following: the behaviour of users of public services often has a decisive influence on overall performance, particularly in terms of health protection, education and public order; citizens generally attach great importance not only to the quality and cost of public services, but also to fair distribution and the fairness of the processes used by Public administrations to carry out their activities.

The New Public Management, arguing that the P.A. can regain its legitimacy by adopting the logic and tools of private companies (Stewart and Walsh, 1992), considered able to meet the needs of its market of reference in an efficient and effective way, has given more and more importance to the demands coming from the citizen, perceived as a customer and not as a simple user (Fiorentini, 1990). In 1993 in the United States, a great reform momentum in the public sector took place at the beginning of Clinton's presidency. In particular, it began to entrust private companies with the management of some public services, paying more attention to the needs of users of public services, considered customers of the Public Administration. This stimulated the spread of benchmarking practices and quality control methodologies similar to those adopted in private companies. Reforms of public accounting systems were initiated and principles similar to those of private companies were introduced, with the aim of extrapolating important economic performance indicators. Finally, tariffs were introduced for some public services that could cover a significant part of production costs.

The approach of New Public Management has involved, in particular, greater attention to the expectations of users of public services, in the years in which several scholars of business administration, developing the insights of Eccles (1991) and Kaplan and Norton (2001), stressed the need for private companies to pay attention to customer satisfaction, also in order to effectively pursue in the long run strategies to maximize value for business owners. According to Dunleavy et al. (2006), the three main directives of New Public Management are: 1) disaggregate, 2) compete, and 3) incentivise.

According to Osborne (2010, p. 1), New Public Management can be considered as a transition phase in the evolutionary process from the traditional or Weberian Public Administration paradigm towards New Public Governance. According to Osborne, the implementation of public policies and the provision of public services have gone through three stages: the traditional Public Administration from the end of the 19th century to the early 1980s; the New Public Management from the early 1980s to the beginning of the new millennium; and, then, that of the emerging New Public Governance. New Public Management would therefore have represented a relatively short phase of transition from the statist and bureaucratic tradition of the traditional Public Administration to the pluralist tradition of New Public Governance, even if significant elements of these three regimes often coexist and overlap. Typical characteristics of the traditional Public Administration, as already discussed in detail in chapter 1, are represented by: 1) prevalence of the principle of legality, 2) attention to administrative rules, 3) the central role of bureaucracy, 4) the separation between politics and administration in public organisations, 5) the prevalence of incremental budgets, 6) the hegemony of professionalism in the provision of public services. This vision had its peak during the period of strong expansion of the welfare state between the 50s and 70s of the twentieth century; it went into crisis towards the end of the 70s as the awareness of the scarcity of resources available in relation to people's expectations in terms of public services spread.

According to Osborne (2010, p.5), neither the traditional Public Administration paradigm nor the NPM paradigm is able to grasp the complexity of the processes of defining, managing and delivering public services in the 21st century. In a nutshell, according to Osborne (2010, p. 9), while the traditional Public Administration paradigm focuses on the political system and New Public Management on the organization, the focus of New Public Governance is on the organization and its environment. The mechanism for allocating resources is: the hierarchy for the traditional Public Administration; the market and the classic contract for the NPM; networks and relational contracts for New Public Governance. In fact, the problem of the evolution from NPM to New Public Governance has been present in the analysis of business economists since the early 1990s.

The philosophy of the NPM has sought to be accredited as an example of good government for Public administrations by calling for universal applicability. However, the results of government plans to introduce NPM principles and techniques have often not lived up to expectations. The disappointment about the results obtained is - not without reason - interpretable as difficulty in overcoming the traditional bureaucratic model or as uncertainty about the ways of technical articulation and implementation of the NPM (lack of attention to the "implementation" and the critical success factors). In fact, there is a conceptual forcing in the philosophy of the NPM when it assimilates tout court the management of a Public Administration to that of a private company. If the limits of the NPM lie in its ambition to transfer the logic of the business world to the public sector in a "quasi-automatic" and uncritical way, it is necessary, in order to rationalise the functioning of Public administrations, to start from the recognition of the elements that characterise (or should characterise) their nature in specific terms.

There have been several criticisms of the NPM, considered too close to the world of private companies, not very critical and unable to highlight the specific decision-making and management of the P.A. In particular, criticism has come from what is called the Traditional Public Administration movement. According to these opponents of New Public Management, privatization prevents teamwork in the administration and cancels out the ethical dimension of public decision making. Moreover, public service management differs fundamentally from the private sector in terms of objectives, context and performance constraints. Analysing the reports presented at the Conference of the European Group of Public Administration (September 1995), of the International Institute of Administrative Sciences, on "European and American Approaches to Public Management", Meneguzzo (1995, p. 492) identified two lines of research on Public Administration, one directly referring to the NPM paradigm, the other connected to the definition of a specific paradigm of Public Governance, which starts from the conviction that the NPM is too close to the world of private enterprises and not able to take into account the specific decision-making and management of Public administrations. In particular, Meneguzzo analyzed the contributions of Kooiman and Van Vliet (1993), aimed at overcoming in some ways the paradigm of New Public Management in the direction of New Public Governance. According to Kooiman and Van Vliet, internationalisation, environmental protection requirements, technological development and a culture of individuality require innovative ways of governing and coordinating socio-economic systems, based on the interaction between government and society, between public and private, and on the emergence of a different relationship between decisive and managed interventions at the political-administrative level and forms of self-organization at the social level. The basic assumption of the New Public Governance is represented by the need to start from the external environment to define the policies of organizational development and managerial requalification addressed within public organizations. In this regard, Kooiman and Van Vliet distinguished three different areas of public management: micro level

(single public organization), meso level (system of companies and public organization), macro level (overall socio-economic system).

1.1.3 The Jones and Thompson's 5R Model

To understand the NPM, a useful reference framework is the Jones and Thompson 5R model (1997) which identifies the operational tools for its strategic implementation. The authors argue that implementing the model would help to make public management more responsive, more transparent, more effective and more efficient. It is, therefore, a project model capable of facing the challenge posed by the reforms and strongly oriented towards the realization of a series of profound political, structural and cultural changes.

The table below summarises the basic principles of the 5Rs and the coherent strategic actions for each principle.

Table 1: The 5R model

Principle	Strategic levers
Restructuring	✓ identify the main competencies of the organization eliminating everything that does not add value to the services and in particular the rules that hinder performance; ✓ outsource services and functions that do not contribute to value creation; ✓ introduce tools such as total quality management, value chain analysis and area-based accounting;

Redesign	✓ reconfigure activities rather than adopt marginal solutions; ✓ to encourage computerization through the use of modern computers and information technologies; ✓ build bottom-up processes; ✓ to increase the quality of the services rendered and at the same time to encourage a reduction in time and costs; ✓ introduce modern tools, such as databases; group work; benchmarking; imposition of time cycles.
Reinvent	✓ develop new planning processes; ✓ identify new service/market strategies; ✓ introduce new tools, such as strategic planning, market research, target costing, networks and alliances.
Realign	✓ align the administrative structures and responsibility centres of the body with the new service/market strategies; ✓ align the control/award structure of the organisation with the administrative structure and the centres of responsibility; ✓ to give importance to the operations centers; ✓ introduce performance-based organizational tools, budgeting and accounting for responsibility centers, incentives.
Rethink	✓ accelerate the cycle of observation, orientation, decision making and action, both to improve performance and to learn more quickly; ✓ giving more powers to "frontline" employees to assess service performance and provide feedback on service strategy and delivery; ✓ build an organization that learns and adapts; ✓ introduce new instruments, such as decentralisation, flexible controls, working capital, rapid analysis and learning models.

Source: *Adapted from Jones and Thompson (1997)*

1.1.3 Public Governance

Of Greek-Latin origin, the Anglo-Saxon term "governance" indicates the art of driving and since the classical age is expressly used to denote the ability to indicate the route to follow (Schneider, 2002). To date, it is difficult to find a single definition of governance, since the excessive use in various sectors does not allow to trace the precise boundaries of the scope of the concept (Vedelago, 2002). In recent years, the word has gained further notoriety precisely because of its conceptual vagueness and the interpretative flexibility inherent in it which, however, on the other hand, have led to a loss of precision in its meaning (Cepiku, 2005).

Governance represents a multi-dimensional concept, whose semantic flexibility has allowed its adoption in different contexts: if in companies it has been identified with the name of "corporate governance", in Public administrations it is called "public governance", while in international institutions it becomes "global governance" (Antonelli, 2010; Hinna, 2009).

Corporate governance refers to the mechanisms, processes and relationships through which companies are controlled and directed (Shailer, 2004), a set of procedures related to the decision-making process by which a board of directors ensures responsibility, fairness and transparency in the relations of a company with its stakeholders: lenders, customers, managers, employees, government and communities (Baums et al., 1994; Shleifer and Vishny, 1997).

Public governance is the set of mechanisms through which a nation, a region or a city pursues and creates a certain social order. In particular, in the public sphere, there is a particular focus, rather than on the actions of individual actors, on the relations that are established between them (Kooiman, 1993), placing the perspective of networks as the one to follow (Cepiku, 2005).

Finally, the ever-increasing international interdependence, combined with the persistence of fragmented cultural, political and social realities, leads to the need for global governance, i.e. a form of global regulation based on self-managed and self-organized networks (Rosenau, 1997; Keohane, 2002; Makinda and Okumu, 2008).

The three conceptual dimensions of governance, applied in different fields, are not to be considered as isolated. On the contrary, they intersect and condition each other, defining principles and models of implementation, one by virtue of the other. We are faced with the application of business principles and models within Public administrations, as well as the integration, within private contexts, of national disciplinary laws (Cepiku, 2005).

Several scholars of public management (Meneguzzo, 2008; Hinna, 2005; Adinolfi, 2005) highlight the poor implementation of the principles of the NPM, which, more than being a new paradigm, has turned out to be a current of thought, surpassed by the debate of Public Governance (Hinna 2009; Polidano and Hulme, 2001).

This theoretical vein has been the subject of wide debate in national and international literature and has been used to describe the processes of change and modernization underway in Public administrations (Kooiman, 1993; Bekke et al., 1995; Rodhes, 1992; Minogue et al. 1998).

Public Governance, which according to Meneguzzo (1997) was established in the 1990s to fill the already discussed gaps in New Public Management (Bekke et al., 1995)

The theory, therefore, challenges the incessant search for technicality by the scholars of the NPM (Adinolfi, 2005), focusing instead on concepts such as participation and accountability, placing the centrality of the citizen-user at the

center of the government process. Other central aspects of Public Governance are: the ability to create shared visions on development prospects, lifelong learning, market opening, the participation of the various components of the social and economic system.

The following table highlights the main differences between the two paradigms.

Table 2: The differences between NPM and PG

	New Public Management	**Public Governance**
Orientation	**Intra - organizational**	**Inter - organizational**
Perspective	Micro	**Micro** **Meso** **Macro**
Actors	Active on all phases of need satisfaction	**Specialization by phase of satisfaction of the need**
System regulatory mechanisms	Competition	**Cooperation and Development**
Liability	To customers	**Towards stakeholders**
Forms of control	Contracts	**Co-production**
Guiding principles	Lowering costs	**Flexibility**
Legitimacy	**Efficiency - Effectiveness - Economic efficiency**	**Participation and Cooperation**

Source: *Adapted from Cepiku (2005) and Poggesi (2006).*

The key idea on which *Public Governance* is based is to go beyond the concept of *government* in favour of that of *governance*. The logic of *Public Governance*, in fact, is linked to development models based on the concepts of participation and cooperation. The theoretical basis on which *Public Governance* is based is that the mission of public organizations is not limited to the efficient production of public

services aimed at minimizing costs and maximizing revenues, but in the ability to build relationships between Public administrations and social partners, as well as in the choice to privilege a development based on knowledge, skills and innovations.

Typically, governance can be defined as a specific guideline for the resolution of common public order problems. Strictly speaking, this implies a redefinition of the role of the citizen, who from being a passive consumer of public services becomes an active participant (Lappe and Du Bois, 1994). Governance refers to a new type of coordination mechanism, which is an alternative to "market anarchy" and "organisational hierarchy" (Amin and Hausner, 1997; Jessop, 1997; Rhodes, 2000). Note that unlike government, whose activities are supported by formal authorities, governance refers to activities supported by shared objectives that may or may not arise from legal and formally prescribed responsibilities (Rosenau, 2000). Therefore, governance seems to be a more all-pervasive and all-embracing phenomenon than government, since it "embraces the concept of government, but also assumes informal, non-governmental mechanisms [...] thus it is possible to conceive of governance without government, a set of regulatory mechanisms in a sphere of activity that functions effectively even though it does not have formal authority (Rosenau, 1992, p. 5).

Such a circular logic of participatory and responsible administration presupposes that public organisations are at the centre of a widespread network of relationships, playing a "light direction" role (Anselmi, 2003). With the emergence of Public Governance, the paradigm, the strategic approach of the P.A. evolves bringing three aspects to the center of attention of the P.A. (Meneguzzo, 1997): 1) the relevance of the interactions with the actors present at the various levels of the social policy context; 2) the governance and coordination of complex networks in the social system; 3) the external orientation, especially towards the social economic environment.

It seems of great interest to broaden the perspective occurred in parallel with the transition from the NPM to *Public Governance*, because this puts into play a set of areas, previously neglected, such as public policies, public service delivery, participation and involvement of citizens, all dimensions that go hand in hand with the focus on internal management (Badinelli et al., 2012; Barile and Polese, 2010; Barile et al., 2014).

According to Public Governance, management has the task of exercising its functions independently of political influence. Often, however, in practice, the role of the manager cannot be completely dissociated from this influence and their function is thus compromised (Barile et al., 2013; Ciasullo et al., 2016; Mele and Polese, 2011).

In so doing, the term governance is seen as the result of the joint efforts of a plurality of actors belonging to the same socio-economic system. According to Rhodes (1996), the term in question has been given a number of meanings that have undermined its usefulness. For the author, governance refers to *self-organizing, interorganizational networks*, of which he identifies the following determining elements: the interdependence between organizations; the continuity of interactions between network members; *game* interactions*;* the significant degree of autonomy from the state.

According to Kooiman (1993), *governance* coincides with the scheme or structure that emerges in a socio-political system as a common outcome or result of the interactive efforts of all actors involved. This pattern cannot be reduced to a single actor or group of actors in particular.

In contrast to a bureaucratic culture centred on formal procedures and insufficient attention to the external environment, the model of Public Governance projects the P.A. towards a decentralized structure based on participation, networking and forms of partnership. Specifically, the widespread awareness on the part of Public

administrations to start from the external environment to define public policies, and consequently to activate innovative governance methods based on the continuous collaboration between the institution and civil society, better denotes the concept of governance[1].

The framework in question requires Public administrations to integrate the action of local public authorities with a wider mobilisation of actors of different types. This inevitably involves the drafting of a project that is shared by the various local actors, able to make public initiatives and policies synergic, promoting a style of government characterized by a greater degree of cooperation and interaction between public and non-public actors (Mayntz, 1999), with interactions of "play", based on trust and governed by rules negotiated and agreed between the participants (Rhodes, 1996).

Public Governance is therefore characterised as a "process of elaboration, determination, implementation and implementation of policy actions, conducted according to criteria of consultation and partnership between public and private or third sector subjects" (Segatori, 2002).

In conclusion, summarizing the brief review carried out so far, we can list the following founding principles of a system of Public Governance (Kickert, 1997): 1) general orientation of the P.A. towards the external environment (community,

[1] The term "governance" has different meanings. You can track at least six of them: (i) as a minimal state, as a consequence of the reduction in the scope and form of public intervention and the use of market and quasi-market systems for the provision of services; (ii) as corporate gevernance, i.e. a system through which organisations are governed and controlled; (iii) as New Public Management, with reference to the introduction of new mechanisms (such as the market) for the provision of services and the separation between decision-making and production activities; (iv) as "good governance", i.e. the exercise of power in accordance with the principles of legality, equity, efficiency, accountability, etc.; (v) as a cybernetic social system, i.e. as a system of interactions between public and private actors, whose contribution is fundamental for the pursuit of results; (vi) as a self-regulating network, i.e. as an organisational structure distinct from the bodies of which it is composed and which is governed autonomously (Rhodes, 1996).

system of economic and social actors on the territory)[2]; 2) involvement at various levels of the citizens/administered users belonging to a given economic and social system; 3) ability of the public actor who has the role of director in the administered territory to manage and coordinate the relations of the network system created (Pellicano et al., 2016; 2015; 2010; Saviano et al., 2010); 4) responsibility of the management and the economic subjects.

1.1.5 Network Governance

Closely related to Public Governance is the approach of Network Governance (Kickert et al., 1997), which aims to develop new forms of reticular governance in line with the characteristics of the external environment, which is complex, dynamic and diverse (D'alessio, 2008, 2002; Antonelli et al., 2004; Kooiman, 1993).

In particular, this framework is based on close interactions between public and private actors who collaborate with each other on the basis of shared interests, while exchanging resources and knowledge of different kinds for the achievement of the same objectives (Ugolini, 2004; Baccarani, 1997; Bonfanti et al., 2015; Capitello et al., 2013; Meneguzzo and Cepiku, 2006). This vision implies the development of new ways of managing socioeconomic systems through the diffusion of a shared management of public and private subjects aimed at the satisfaction of collective interests (Agranoff and McGuire, 2003; O'Toole and Meier, 2004). In addition, a new management system is also required to bring about changes to the administration, which should thus move from a monocentric

[2] Public governance requires that modernization should go beyond an intra-organizational vision limited to internal management in favour of an inter-organizational vision (Adinolfi, 2005) oriented towards the external environment, thus integrating the micro perspective typical of the NPM with the meso and macro perspective (Cepiku and Meneguzzo, 2005; Hinna, 2009).

logic to a polycentric one developed through the networks (Adinolfi, 2005; Bevir and Rodhes, 2003).

By accentuating the existing interdependencies between the actors of the social and economic system, the Network Governance paradigm goes beyond the public-private contrast typical of New Public Management. Although legally independent, the actors involved are nevertheless linked to each other because they share the same aims. It follows that the objectives of each Public Administration will be the joint outcome of the relations between the different actors of the network, whose functioning depends on the ability of the public governing body to exercise systemic governance (Cristofoli and Zerbini, 2000).

In this way, the focus moves from the micro level of the specific Public Administration to a meso level, then to a system of companies and public organizations, up to a macro level that is that of multi-level governance, relating to the socio-economic system in which the P.A. is responsible for the overall results of a complex system of organizations (Menguzzo, 1997).

In the literature, the following relational strategies are particularly relevant: public-private partnerships; initiatives and interactions in networks for the development of local governance (Bogason and Toonen, 1998; Jackson and Stainsby, 2000; Kliin and Koppenian, 2000; Kliin and Skelcher, 2007; Kooiman, 2004); the design and implementation of shared strategies; the role assumed by the different actors involved within the network (Kickert et.al, 1997; Kliin and Koppenian, 2000; Kooiman, 2004).

Network governance thus implies the need for the integration of Public administrations, private enterprises, citizens and the third sector in the formulation of policies and programmes for the provision of services (Rhodes, 1992, 1996, 1997, 1998, 2000). This requires the P.A. to develop reticular structures and

collaborative relationships for the sharing of functions, objectives and responsibilities with other public and private subjects.

In other words, the paradigm has radically changed the conception of the institution-community relationship of reference and of the relative process of choice of the public policies. This is no longer a hierarchical, top-down regulation, which imposes on the users of public policies the choices made by the administration, but a bottom-up or, in some cases, circular approach, in which public policies are the result of a process of cooperation between public and private actors (Hirst, 2000; Rhodes, 1997; Sanarclens, 1998).

The approach, in fact, supports the urgency of creating inter-company networks that are characterized by the interdependence between businesses and administrations and the presence of repeated interactions over time between the various actors (Mercury and Martinez, 2010) who share different resources of both tangible and intangible nature (Dell'atti et al., 2010). In this way, the role of the public actor is reduced, from being a decision-maker to becoming a director of the decision-making processes, favouring opportunities for collaboration and participation in public governance, aimed at the production of local collective goods for territorial competitiveness (Castellani and Bonfanti, 2009; Castellani and Rossato, 2014; Fotino et al., 2018; Crouch et.al. 2004).

Even within the same neo-institutional theory, it is argued that the creation of networks and the participation of public and private actors in the decision-making process strengthen economic performance, while at the same time stimulating the growth of local social capital.

These integrated planning activities make the territory an experimental laboratory in which public and private actors experiment, through cooperative relationships, new ways of governance to foster innovation, creativity and socio-economic

development in the area, where there is no dominant actor capable of influencing or regulating (Rhodes, 1996).

According to Rhodes (1996), the function of government is to "facilitate socio-political interactions, encourage multiple and different ways to address problems and distribute services among the many actors". Offe's thought (1984) is on the same wavelength, for which the results of an administrative action do not derive from the authoritative implementation of pre-established rules but, rather, from a process of co-production of the administration and its clients.

Therefore, the perspective of Network Governance focuses on the creation of networks that would improve the participation and mobilization of local actors, changing the logic of intervention of those who are part of the network by preparing all participants in a "cooperative game". In fact, if established in a stable way, the cooperation increases the motivation and consequently the interest of the various actors involved in the intent to plan solutions to achieve satisfactory results for all actors in the network. In this way, each member will be willing to redefine their own goals according to the pursuit of collective goals, also because the shared goals are faster to achieve both in the decision-making phase and in the implementation.

In conclusion, given the increasing complexity and fragmentation of the interests and objectives of the different actors involved in each public policy or programme, cooperation can bring about a gradual improvement in the efficiency and effectiveness of public policies, allowing the development of optimal solutions to the different problems of each actor in the network.

1.1.6 New Public Administration

The birth of the *New Public Administration* (NPA) can be understood as an anti-hierarchical reaction to the old paradigms, whose focus is on the ability of the government to provide services of public interest to citizens not limited to public policies alone, in response to the changing needs of the citizens themselves.

The emergence of the NPA can be traced back chronologically to the late 1960s, but in truth this approach continues to be analyzed and developed in literature until the end of the last century (Marini, 1971; Frederickson, 1980; Waldo, 1971). There are many reasons that have led to the creation of a new administrative framework. First of all, the difficulty for associations such as the UN and UNICEF to carry out their tasks, in the absence of effective and efficient systems of administration, following the advent of the two great wars. Secondly, the belief that the inefficiency of administrators has led to an increase in population, unemployment and poverty that has led to a reformulation of the traditional logic of governance. Finally, a final factor triggering the origin and spread of the NPA is the awareness that the Public Administration was mostly used to maintain the status quo enjoyed by the elite class.

This has revealed the need to rethink the objectives and scope of Public Administration and its leadership. The NPA postulates the existence of a subtle yet incremental shift towards democratic management practices and social equity, giving importance to the problems of rationality, methodology and epistemology (Frederickson, 1996). The NPA stresses the need to understand leadership as a participatory and democratic authority within a teamwork.

The concept of NPA is based on four fundamental aspects (Marini, 1971):

- Change: The idea of administration in the NPM is mainly aimed at preserving the status quo of the state. The great revolution of this paradigm lies in the

introduction of change, which implies the possibility of changing the state of things to respond to various socio-economic and political changes. Maintaining the status quo, of course, mainly favours the elite classes, not including the interests of citizens. Introducing change means inducing operational flexibility and organisational adaptability within Public Administration mechanisms;

- Relevance: the field of action of the Public Administration is restricted to what are actually the interests of the community. Every society presents problems that have an impact on different social levels. Think, for example, of local specificities typical of a country, a given culture, a specific geographical area. It is therefore necessary to focus only on those ethnic-social changes of specific relevance in the area to which the administration belongs. All that needs to be done is to integrate the social needs and views of citizens with those already taken into account in the previous idea of Public Administration management;
- Equity, fairness and justice: in the NPA social equity is considered the best way to guide human development. The concept of social equity is expressed in taking into account the most disadvantaged classes of society, taking into account their needs and redistributing wealth while maintaining these activities as a basic objective of the administration.
- Value: the concept of value changes radically, considering human value as the main source and therefore considering the administration itself as a provider of services that address the person. The satisfaction of the citizen as such becomes an objective of this framework.

In conclusion, this type of approach aims to achieve harmony and integration within society through the principles of equity and social justice. In summary, the driving force behind the NPA is the emphasis placed on the need for change in response to better service efficiency and social equity. Within this approach, problems of rationality and value are also particularly important. Therefore, it can be said that the NPA is characterised by a democratic and humanistic

administrative character, which mainly concerns the construction of institutions and professional skills and which pays particular attention to politics and issues of justice and equity.

1.2 Service era: service-oriented management paradigms

The incessant change of the environmental scenarios determined by the current transformations, capable of orienting towards increasingly flexible production methods, a widespread use of new information and communication technologies and a marked globalization of markets, has led to the advent of the "Service era" (Polese et al., 2016; Wieland et al., 2012).

This phase is mainly based on well-established external relations that are likely to last in the long term within the dynamics of the general government. As a result, companies need to adopt corporate policies, not only customer-oriented, but based on the concrete implementation of value creation systems. For this reason, this period, which began in the 1980s and still lasts, is defined by the terminology: "*value orientation*". In essence, this is an era in which, as in the previous stage, the existence of a highly saturated market continues to be kept under review, with the need to carry out multi-dimensional analyses of individuals, in order to identify the contextual differences that characterise each of them and, at the same time, to implement a type of communication commensurate with the needs of each stakeholder.

In this wake, between the 1980s and 1990s, *stakeholder theory* postulates developed (Dell'atti, 2003; Donaldson and Preston, 1995; Gilbert and Freeman, 1988; Sacconi, 2005), based on the idea that in order to pursue positive business results it was necessary to aim at satisfying the needs of all stakeholders, considered capable of exerting pressure in terms of expectations on Public

administrations, and, at the same time, influencing their decision-making policies. In other words, companies are called upon not only to respect the prerogatives of shareholders, but also to pay attention to the demands of so-called social stakeholders, who, even if they are not directly involved in the economic-productive process, are, in any case, interested in the social welfare of their communities.

Sacconi (2005) emphasizes the strong relational component that characterizes this approach, highlighting the need to create an expanded governance model of organization able to ferry the concept of fiduciary duty from a mono-stakeholder perspective to a multi-stakeholder one.

In conjunction with the changes that affect the management vision of organizations, those related to the distinctive features of the profile of citizen-consumers, increasingly competent in terms of knowledge of the world of organizations and products, with an active role within the process of use of public service (Firat *et al.* , 1995; Bowers *et al.* , 1990), are gradually spreading.

Toffler (1980) defines the consumer as a real *prosumer, able to* take part in all the important moments of the production process, even going so far as to demand an adequate level of transparency in the work of companies. The focus, therefore, passes from basic needs to the need to live real consumer experiences, in which the emotional aspect becomes a major component from both the economic and social point of view.

This principle represents the starting point for the diffusion of the various forms of *emotional branding,* which, as argued by Arnould and Thompson (2005), attach great importance to the emotional, contextual and symbolic elements of consumption, leaving in the background the more properly utilitarian aspects[3].

[3] The emotional branding was conceived by Gobe (2001), who lists the ten commandments in a sort of "Decalogue of change": from consumers to "people", from product to "experience", from honesty to "trust",

Holbrook (1996) also makes a contribution in this direction, defining the value for the consumer as an "interactive relativistic experience of preference".

In the light of these considerations, it seems evident that the initial shift from a mono-centric approach, based on a fully *user or provider oriented* logic, to a dualistic approach, based on the *user-provider* relationship, was subsequently overcome by a multi-level vision, based on the concept of network. In the wake of such a change, in the 1990s a new literary trend was established (Achrol and Kotler, 1999), which was a counterbalance to the management model of integrated logistics, leading to the emergence of particularly important and innovative concepts such as value constellation (Normann and Ramirez, 1993) and supply chain management (Cooper and Ellram, 1993).

This line of research marks a real change of perspective, offering the possibility of ranging from everyday life to that of organization, from biology to computer science, highlighting the relationships of dependency that characterize organizations in the current economic scenario (Polese, 2009; Vicari, 1991) in order to create and consolidate a common direction that allows to improve the processes of value creation.

The quality of the interactions becomes, therefore, a determining element in order to reach the optimization in the allocation of the resources and to guarantee the obtaining of adequate advantages, entirely determined by these exchanges of information (Capra, 2002; Castells, 1996; Richardson, 1972; Hakansson and Ostberg, 1975).

On the basis of these social and economic changes, Normann and Ramirez (1993) highlight the need to arrive at a new theoretical vision that focuses more on the

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from quality to "preference", from notoriety to "aspirationality", from identity to "personality", from functionality to "sensations", from ubiquity to "presence", from communication to "dialogue", from service to "relationship".

process of value creation than on the supply of material goods. According to the scholar, the aim of this orientation should be to describe the transition from a production-oriented approach to one more specifically based on the relational aspect, defining a new business model in which organizations are considered real value-creating entities. In other words, Normann (1997) now considers the clear distinction between goods and services anachronistic, since the service is no longer a mere accessory element, but precisely because of its composition in a set of activities capable of developing relationships, is a new tool able to create new configurations of elements and a new conception of the economy, understood as a network of activities and actors connected to each other and coordinated towards processes of co-creation of value able to achieve a more creative offer.

In reiterating these assumptions, Normann and Ramirez (1993) introduced the notion of "value constellation" to describe the networks between organisations capable of giving rise to two-way relations, not only between them, but also with the consumers with whom they come into contact, establishing with the latter exchanges aimed not only at the realisation of flows of goods and services or of money and information, but also at something more. According to scholars, co-creation can only take place within the constellation, developing innovation through the exchange of material resources[4].

Around the beginning of the new millennium, Gummessonn (2010) goes beyond what was highlighted by the first studies on relationship marketing, stating that today's environmental scenarios are made up of organizations that are completely immersed in complex networks of relationships and, for this very reason, able to

[4] Normann defines the offer of services as "frozen knowledge", understood as a central element, as it represents a plus for the achievement of competitive advantage. Therefore, the importance given to it led to the birth of the "Knowledge-based view" (Grant, 1996; Roos, 1998; Hoskisson et al., 1999), which considers know-how as the most important strategic resource owned by a company. It considers organisations to be heterogeneous entities full of knowledge, enabling them to secure a sustainable competitive advantage on the one hand, and differentiation on the other, as intangible resources are difficult to imitate (Wiklund and Shepherd, 2003).

give life to a new perspective called "many-to-many". Going deeper into the discussion, several scholars belonging to different research strands criticize the model of analysis of services classically based on characteristics such as intangibility, heterogeneity, separability and perishability (Lovelock and Yip, 1996) and aimed at distinguishing services from material goods. On the basis of these reflections, Vargo and Lusch (2004) then formulated the first contributions on the S-Dl, placing the relational component and, consequently, the human component at the centre of economic exchange.

The authors focus their attention on the conceptual overcoming of the marked separation between material goods and immaterial services, underlining how an approach based on the discriminating elements between them proves the persistence of a "product-oriented" philosophy that identifies services by exclusion (Judd, 1964).

The classic model of service analysis is criticised above all for its inseparability, since for the production of certain products such as cars and houses, the involvement of the customer in the production of value is a very present element in order to guarantee the customisation of the product. In the same vein are the criticisms levelled at the classic model concerning the requirement of intangibility, in that the indispensable role of services for the exchange of tangible goods clearly emerges.

As far as heterogeneity is concerned, on the other hand, it seems evident that within the current environmental scenario there is a tendency to move away from product standardisation in order to approach so-called customisation. Likewise, the emerging approach considers perishability as an added value, rather than a limit, highlighting how the result of delivery, although not storeable, is determinable in the form of knowledge and experience for each participant in the value generation process. From this it emerges how it is possible to identify a

fourth phase of the process of evolution of services, in which the study of the latter is combined with the systemic vision of the economy, giving space to the birth of lines of research such as Service Dominant Logic (Vargo and Lusch, 2004) and Service Science, Management and Engineering (SSME, Spohrer et al., 2007), whose purpose is to systematize the characteristics and the most relevant notions of the logic of services.

The evolutionary path of the concept of service has made it possible to identify various points of intersection between the lines of research mentioned so far, all oriented to the analysis and study of the main characteristics of the services.

In this regard, Troisi (2016) has proceeded to systematize the contribution offered by each strand of research that has been interested in the service sector, highlighting any points of contact between them (see Table 3).

Table 3: Elements of intersection between the service logic search lines

Approach	Focus of the approach	Points of intersection	Bibliographic references
Total quality management	- Reducing costs; - Consumer perception of quality.	- Central role of the consumer; - The offer of value is determined by a single entity that is the consumer.	Garvin, 1987; Juran, 1988.
Resource - based view	- Intangible assets are the key resource of a company or any organization; - Achieving a competitive;	- Relevance of intangible aspects; - Competitive advantage is the result of a combination of	Penrose, 1959; Porter, 1985; Hamel and Prahlad, 1989.

	advantage only requires the acquisition of the "knowledge" resource.	knowledge resources.	
Relational marketing ***Customer relationship***	- Existence of organizational partnerships; - Cooperation and collaboration with consumers; - Team work and inter-functional and interactive work within the company.	- Both internal and external interaction is a prerequisite for achieving value creation.	Berry, 1985; Grönroos, 1994; Newell, 2000; Girishankar, 2000.
Nordic School ***Service marketing***	- Physical or even material goods are tools to help in the implementation of services and to pursue, ultimately, the creation of value.	- Tangible goods are instrumental to the provision of services; - Interaction represents a real creation of value; - The services are provided in order to bring user/provider benefits.	Grönroos, 1984; Gummesson, 1987.
Stakeholder theory	- Each stakeholder must participate in the company's processes; - The organization creates a multi-level relationship network.	- Involvement of all actors in value generation processes.	Donaldson and Preston, 1995; Gilbert and Freeman, 1988; Sacconi, 2005.
Prosumption	- The consumer is considered to be a	- The customer plays a central role in value	Toffler, 1980.

	part-time employee who is an integral part of the value chain.	generation processes - The value of the offer is determined in "use".	
Experiential marketing	- Buyer-consumers do not want to consume goods, but to live experiences.	- Value is produced by the consumer; - The supply and consumption of goods are concomitant; - The exchange generates the rise of an experience.	Schmitt, 2000.
Network theory	- Companies implement networks of relationships, both internal and external, in order to co-create value.	- In addition to consumers, their social networks also play an important role in value creation processes.	Richardson, 1972; Castells, 1996; Capra, 2002).

Source: *Author's elaboration*

In examining the characteristics of the service, Vargo and Lusch (2004) underline that in the delivery processes the object of the exchange is represented by specialized and intangible resources, rather than by finished products. Moreover, scholars point out that the creation of value is not confined to the act of production in the company, but extends to the moment of interaction between the actors involved in the process. The latter are, first and foremost, consumers, who no longer play a passive role, but rather a role of collaborative, creative actors capable of contributing to the generation of the value of the good/service.

Table 4 proves the existence of numerous analogies between the lines of research concerning the logic of services; all this has allowed us to arrive at a type of cultural revolution that has incorporated in itself the contribution of each current

of research, opening the doors to a culture of services able to trace a single thread suitable to enclose under the same roof the different theories based on a systemic vision of the economy.

Table 4: Overview of service definitions

Definitions of the concept of service	Assertions arising from	References
"Activities consumed at the same time as production",	Services are considered to be particular types of goods.	Say, 1821
"Services are exchanged with other services".	Services acquire autonomy with respect to material goods, forming the basis of any economic transaction.	Bastiat, 1860
"It is not the resources themselves that constitute the inputs of the production process, but the services that the resources can release".	Services are resources capable of representing production outputs.	Penrose, 1959
"Services are characterized by their nature (type of action and recipients), relationships with consumers (type of distribution and relationship), decisions (customization and judgments), economic criteria (demand and capacity), distribution methods (place of delivery and nature of physical or virtual space)".	The definition of services passes through the identification of a set of characteristics related to them that have the purpose of making them different and more problematic than material goods.	Lovelock, 1983

"A service is a process consisting of a series of activities of a more or less intangible nature that normally, but not necessarily, take place in the interaction between customer and employee and/or between physical resources or products and/or systems of the service provider, which are provided as solutions to customer problems". "Physical goods become only one element among others within a total offer of services. This implies that the marketing of goods and services converge, but the latter will come to dominate".	Physical goods are only one of the many elements of a service offer; Relevance of value creation processes; Material goods are one of the elements of the process and play a supporting role for consumers in the context of value generation processes.	Grönroos, 1990
"Consumers don't buy goods or services, but offers that deliver services that create value".	A holistic view is then determined, according to which goods represent one of the various elements of a wider process.	Gummesson and Polese, 2009
"A set of activities (including the use of products) that make new relationships and new element configurations possible".	A relational orientation takes root, in which the interactive exchange of resources within the company becomes more and more central.	Normann, 1997

Source: *Adaptation from Troisi (2016)*

1.2.1 A new concept of service

The previous paragraph showed how, over time, the evolution of the competitive environment has led to a first and gradual shift from a more product-oriented, efficient approach to a sales-focused one. Then, at the same time as the increase in competition and the affirmation of the so-called "mass society", a further step was taken, called "*hard sell orientation"*. The birth of the latter, between the 50's and 60's of the last century, was based on mass production in which, once the objective of consolidating production mechanisms was pursued, the focus was entirely shifted to sales, since in the presence of an excess of supply over demand, it became increasingly complicated to place the output on the markets. However, from an economic point of view, the exponential increase in the quantity requested has led to the overcoming of the neoclassical paradigm, which coincided with the crisis of the Taylorist model[5].

Once the primary needs are satisfied, the market is no longer able to independently absorb the high levels of production and, therefore, it is essential to have the ability to effectively and efficiently manage the sales networks and communication flows. The final objective, therefore, is not so much that of producing quality output, but that of knowing how to place it on the market, adopting an *inside-out* perspective, solely intended to achieve the so-called economies of experience[6].

At the same time, the formulation of the concept of service continues to make progress, even if the latter is still considered only as instrumental to the

[5] Alfred Sloan, President of General Motors, introduced the technique of planned obsolescence, which provided for the possibility of making small changes in the production of cars, so as to make the previous model look out of fashion.

[6] Economies of experience (or learning) enable companies to pursue positive results by obtaining higher profit margins in relation to higher volumes of output produced and placed on the market. In order to achieve these objectives, an appropriate level of experience, i.e. the cumulative number of products produced up to the date in question, is required.

implementation of economic transactions in the short term. This opens the way to the birth and subsequent spread of a Service-Dominant model, within which economic exchanges are considered as real relations between "specialized suppliers", who exchange services with other "specialized suppliers". In this wake, even those who are still tied to the "good dominant" logic begin to perceive the changes taking place, highlighting how the relevance of material products derives from the possibility of obtaining from them the services they incorporate, rather than owning them in a completely passive way.

The definitions of the concept of service have therefore found their place in various fields, ranging from psychology to information technology, from engineering to behavioural sciences, from marketing to management, giving rise to a process that starts from the Fordist era to arrive at the current Service era.

In this phase, the service is considered as a particular type of exchange, concerning analyses carried out on companies, jobs, productivity - understood as the ratio between income and expenditure - and any other element capable of directing the action of organizations towards effectiveness and efficiency (Triplett and Bosworth, 2004).

Hill (1977) also goes beyond this definition, attributing to the service the potential of an instrument aimed at allowing the change in the condition of a person or a good belonging to any economic subject. Berry (1980) and Zeithaml and Bitner (1996) consider it to be an act or performance, or rather an activity or series of activities, which can provide appropriate solutions to consumer problems.

These latter definitions have subsequently inspired further reflections aimed at highlighting the growing importance of services in every sector of activity, giving companies the use of a service-oriented approach, highlighting both the culture of service and the quality of performance and innovation.

1.2.2 The advent of the Service Economy

The affirmation of supply at the expense of demand and the growing specialisation of markets mark the beginning of a new phase, which sees for the first time a real interest of companies in the study of consumer behaviour, trying to focus on their needs and changing needs, with the ultimate aim of creating goods suitable for their satisfaction (Hysa et al., 2016; Baccarani et al., 2010; Cassia et al., 2017, 2015, 2014; Pellicano, 1992, 1994; Polese et al., 2019; Ugolini, 2009; Testa et al., 2001). In this sense, Alderson (1957) points out that in the field of management there was a tendency to seek, rather than an interpretation of the utility created by the company, an interpretation that concerned the process of creating utility in its entirety. This orientation led to the functional school of marketing in the mid-1960s to develop the marketing management research strand, which presents itself as an approach characterized, on the one hand, by the application of decision-making to marketing functions and, on the other hand, by the now rediscovered centrality of the role of the consumer (Gambarov et al., 2017; Ugolini et al., 2014; Levitt, 1960; Kotler, 1967).

In this regard, McCarthy (1960) defines marketing as a decision-making process aimed at satisfying the demands of buyers in order to pursue an efficient and effective management of the marketing mix[7].

The orientation based on marketing, that is, on an *outside-in* or even *pull* perspective, which starts from the analysis of the market and consumer behaviour, exceeds in this phase the *push* perspective, mainly oriented towards the pursuit of economies of scope or variety, whose only objective is to reduce the unit cost of the output produced through the production of a plurality of goods in a joint

[7] The marketing mix is a model designed by McCarthy (1960) to help achieve a company's sales objectives by combining four variables. However, before you can combine these four elements, you must first formulate your marketing strategy: *search, segmentation, positioning and targeting, and* then include the above elements in the marketing strategy.

manner. The affirmation of this perspective follows the consolidation of an economic scenario in which supply and demand are rather static, suggesting as the only possible way to obtain an adequate competitive advantage over competitors, the need to aim at customer satisfaction, placing the latter at the centre of the decision-making process. In this way we move from a type of mass market to a market in which the fundamental element becomes segmentation, which allows the perfect identification of the characteristics of consumers.

It is precisely in this scenario that the first paradigmatic approaches oriented towards personalized marketing are beginning to emerge, in which the predominant aspect becomes that of considering consumers not as an undifferentiated mass and bearer of only physiological needs, but as real homogeneous groups in terms of values and characteristics - leisure use, cultural consumption - able to facilitate the formation of an offer aimed at placing on the market a product specifically tailored to the consumer and able to generate not only utility, but also to generate a real lifestyle. In this direction, the Total Quality Management (TQM) framework has played a leading role, highlighting the important shift from a manufacturing vision to a consumer-oriented vision, defined by Garvin (1987) and Juran (1988) as a vision mainly aimed at reducing costs through the preventive control of goods within the production process, thus avoiding the risk that any defects of the same were identified by the consumer at the time of consumption. In this way, the focus is on the perceptual dimension of the purchases according to the idea that the buyer, in the consumption phase, determines the value of the products. All this leads to the emergence of a theory that, starting from the awareness of the existence of a rapid and incessant technological evolution, as well as an increasingly marked reduction in the boundaries between different industrial sectors, shifts the focus on the need for companies to achieve a unique competitive advantage, unrepeatable and durable, able to find a foothold only on the distinctive resources in their possession.

This theory is called *Resource-Based View* (RBV) and is based on a vision of the organization oriented to the combination of resources, which allows to achieve a heterogeneous offer of services and, therefore, potentially capable of making companies acquire a strong character of uniqueness. From this point of view, it is not so much resources that represent the output of production, but rather the services that they bring with them (Penrose, 1959). This orientation allows to link for the first time the concept of service to that of resource, giving particular prominence in the corporate business to intangible resources, which end up leading the competition between companies. Porter (1985) points out that RBV's objective is to gain an understanding of all business practices necessary to achieve a sustainable competitive advantage for companies. Starting from this consideration, Hamel et al. (1989) then stressed that the resources needed to achieve a lasting competitive advantage are represented, rather than by the finished products, by the distinctive internal skills of the company, which can be grouped as follows:

- Proactive capacity of an organisation to anticipate future consumer needs;
- Ability of managers to guide members of the organization at each level towards the common pursuit of goals and the search for opportunities.

The importance assumed by these characteristics also follows and above all the growing uncertainty has begun to pervade the markets. In such a scenario, in fact, the importance of external relations is growing and the need to maintain them in the long term is growing. Only in this way can it be possible to achieve adequate flexibility of company boundaries and a consequent dynamism of external relations capable of intercepting and meeting the changing needs of demand. This change leads not only to a redefinition of the paradigms that precede RBV, but finally leads to the affirmation of a particular sub-discipline of marketing, the marketing of services, which, rather than considering the roles of consumers and producers as separate, considers them as actors who indiscriminately participate in

the process of co-production of value, moving away from the idea of exchange aimed at the mere search for usefulness. This moves from a single-centre corporate orientation, centred on the separate role between customer and supplier, to one in which the two figures are considered to belong to a single value generation process.

The paradigm changes mentioned above lead, therefore, to the affirmation of theories oriented towards a greater importance of intangible resources. However, in relation to the evolution of services, it is difficult to identify the origins of modern *Service Research*.

In this regard, some scholars (Fisk and Grove, 2007) state that a first development of a science of services took place in the first half of the '80s, divided into three stages that can be defined. In the 70s, in fact, there were some contributions from scholars who addressed the issue of marketing services, oriented to the deepening of the issue of services, with the ultimate goal of overcoming an orientation totally based on the manufacturing model (Normann, 2001). Subsequently, the focus on these issues grew further, leading to the birth of Service Management and then expanding the scope of action to *Human-Resource Management*, *Operation Management* and *Quality Management.*

Fuchs (1965) for the first time referred to the "*Service Economy"*, opening the door to a strong interest in services that led to the development of two different approaches: the political and industrial economy (Momigliano and Siniscalco, 1982) and that relating to managerial studies on knowledge and innovation (Ciasullo et al., 2016, 2017; Ciasullo et al., 2017). In Great Britain, too, interest in Service Science has been strongly and decisively felt, with the aim of harmoniously associating the concept of service with organisational methods of a manufacturing nature. At the beginning, the emphasis was on the differences between goods and services; only in later periods did the orientation begin to

change, pushing towards a real integration between the same, which saw services play a decisive role for any type of offer (Wyckham *et al.* (1975; Gummesson and Grönroos, 1987; Eiglier and Langeard, 1987; Normann, 2001).

However, at this stage, we are still far from affirming a clear independence of services with respect to goods, even though we are nevertheless grasping the objective of putting the concept of service in the spotlight, obtaining a respectable result, given the strong pressures exerted by the neoclassical vision of the economy. In fact, initially this issue was rejected by most scholars, who considered the intangible resources of the offer more appropriate to create problems in terms of uncertainty and lack of concreteness, rather than to provide advantages in competitive terms; this phase in which it was still evident a certain degree of reticence towards the services is precisely defined *Mainstream Service Management*.

The second stage that has characterized the development of the science of services, framed in a period between 1980 and 1985, is that in which it was determined a sudden spread of studies that concerned services, which only in the next phase (the third) receive the attestation of autonomous sector finally not linked to marketing.

At this stage, in England, independent research strands are beginning to spread with respect to the manufacturing sector, whose focus is on the importance of customer relations and the contribution, certainly improving, that they bring to performance (Sullivan, 1982). Similar lines of research, oriented towards the study of services and the results in terms of quality that they allow to pursue, are also developed in Germany (Evanschitzky and Wunderlich, 2006; Fassnacht and Koese, 2006; Specht *et al.* , 2007).

There have been several attempts in the literature to provide an exhaustive definition of the concept of service, but given the complexity of the phenomenon,

each of them has been in vain. However, several frameworks were born around the theme, among which particular importance is given to what sees among the main authors Lovelock (1983), which, in examining the differences between manufacturing products and services, identifies four fundamental aspects suitable to discriminate between them: inseparability between production and consumption; heterogeneity of the supply of services and the ways in which consumers perceive the quality of the same; intangibility of outputs, no longer based on static objects, but on services that can generate experience; perishability, understood as an impediment to preserve products.

The period in which a real contamination between service management and marketing is reached is that between the 70s and 80s, a period in which the attention of scholars is more focused on the study of relationships with consumers and on the elements that can increase the quality of services. In this way, *service management is* spread, which plays a significant role in the spread of the different currents within Service Research, offering it an important contribution to the definition of the prominent role that services assume in economic exchanges.

Among the main pioneers of this real change of perspective are the scholars belonging to the "Nordic School of Service", such as Gummesson (1987) and Grönroos (1984), the first to make an effort aimed at systematizing the transition from a logic based on goods to a logic based on services, which Gummesson himself (2008) defines as totalizing, as suitable to project the service management in a holistic logic, which considers goods only as one of the elements participating in the overall supply of services. In this way, a real bond of indissolubility between goods and services takes shape, which sees the latter take on a decisive role in any type of offer, both material and immaterial (Grönroos, 2000). Previously, however, during the period in which the manufacturing industry was in vogue, services tended to be considered in a negative way, that is, as elements that participated only in a residual way in the offer and, more precisely, only for

the part of it not covered by physical goods, as they were considered to be lacking in perfect autonomy and, therefore, identifiable and qualifiable only if accompanied by tangible goods. All of this has led to the following considerations being made among service management scholars (Grönroos, 1984):

- concentration on goods does not allow to focus attention on what really interests consumers: the process of value creation;
- Products can be seen as platforms for services;
- Goods are considered as a resource as well as others able to support consumers in co-creation processes.

Grönroos (1990) considers service as a process comprising a series of predominantly intangible activities, generally, but not necessarily, resulting from the interaction between customer and employee and/or between physical resources produced and/or systems of the service provider and capable of providing solutions to customer problems.

These considerations highlight how the birth of relational management originated from the management of services, precisely because of the fact that carrying out activities with someone and for someone was an essential requirement for the creation of value. In fact, external relations and their persistence over time seem to represent the only viable way to pursue the flexibility of corporate boundaries, so as to ensure the right openness, together with a balanced dynamism, capable of intercepting the increasingly changing needs of customers. It follows that environmental changes and the turbulence of the economic scenario have determined the transition from transactional marketing, typically related to the period of mass production and standardization, to relational marketing (Grönroos, 1994; Payne et al., 2008), based more appropriately on concepts such as team work, inter-functional collaboration within the company, inter-organizational partnerships, long-term collaboration with consumers and the concept of co-creation of value. Relationship management includes relationship marketing in the

strict sense (Zeithaml et al., 1985), customer relationship management (Newell, 2000; Girishankar, 2000), and one-to-one marketing (Gummesson, 1987).

The spread and increasing number of scientific contributions under the so-called *Relationship Management* are, in particular, dependent on two fundamental concepts:

- part-time marketers (Gummesson, 1977);
- interactive marketing function, i.e. "the marketing impact of interactions between part-time marketers, other resources and customers as a means of building lasting relationships with customers" (Grönroos, 1990).

The increase in the importance given to competitiveness, together with the increase in space and opportunities for consumption, has opened the door to corporate policies aimed at creating products with high added value, especially through the use of effective and efficient management capable of making goods recognizable among other goods. All this, although it was born within the private sector, has progressively conditioned also the dynamics and logics characterizing the management of Public administrations.

In this sense, two new paradigms have taken over in the management of Public administrations, Public Value Management and New Public Service, as discussed in the following paragraphs.

1.2.3 Public Value Management

Network governance is an approach to decision-making in which a collective logic for decision-making prevails and in which the role of the participants is of crucial importance, seen as legitimate members of the decision-making process in

the context of considerable uncertainty and complexity that characterizes the Public Administration. The development of reticular approaches in the field of public management implies new ways of management and this poses the problem of the need to seek an appropriate management style, an all-inclusive framework that best fits the canons of network governance.

Precisely because New Public Management is based on a clear set of doctrinal components (Hood 1991, 1995), after its formulation there emerges the need for an alternative paradigm that is not based exclusively on rules or incentives for the practice of public service.

For this reason, many authors declare the NPM dead and buried (Dunleavy et al., 2006). In its place, the managerial style most in line with the needs of Network Governance seems to be the paradigm of Public Value Management (Moore 1995) within which the concepts of dialogue and exchange assume centrality (Stoker, 2005).

In contrast to the nature of previous approaches, Public Value Management aims to achieve public value, which according to Kelly et al. (2002) is determined by citizens' preferences, expressed through a variety of ways, from the simplest forms of participation to the attribution of consistent decision-making power in the choice of elected politicians. Public value should not be understood as the mere sum of the individual preferences of users or producers of public services but, rather, as a set of collective actions and choices, decisions involving both elected and appointed government officials and the main stakeholders (Stoker, 2005). Achieving public value depends on a series of actions linked to the construction and maintenance of relationships within a network for the provision of services (Barile et al., 2013; Pellicano, 2002, 2004; Pellicano and Ciasullo, 2010). In PVM the understanding of the complex issue of public interest, the nature of public services, the role of managers and the democratic processes put in

place are in contrast with the NPM and the still earlier Traditional Public Administration (TPA)[8].

However, even if the PVM contrasts with the previous currents, it cannot be considered as a completely new trend.

Every emerging framework, in fact, is born in response to the overcoming of the defects of the previous one. For example, the NPM develops in response to the administrative inefficiencies of the TPA, just as the PVM overcomes, at least in part, the excessive focus on the practical dimension of the NPM. Moreover, if the above paradigms provide for the manager to check compliance with the rules and appropriate procedures, the PVM, also in line with the definition of governance, attributes to the manager the active role of leading the networks, the tasks of deliberation and delivery and maintenance of the overall capacity of the system (Kelly and Muers, 2002).

It is, therefore, a democratic leadership, in which no one has the monopoly of the sector on public service; rather, it is essential to maintain relations through shared values. Moore (1995) believes that public managers can create greater public value by proactively engaging in the following areas: increasing the quality or quantity of public activities for the resources consumed; reducing the costs used to achieve current production levels; making public organisations more capable of identifying and responding to citizens' aspirations; increasing the fairness with which public sector operators operate; and increasing the continuing responsiveness to citizens.

[8] The Traditional model of Public Administration is based on Weberian thinking about the nature of bureaucracy, then on a hierarchical and monocratic point of view where power is top-down. It is a control system in which policies are spread from the top to a series of departments in which each worker or manager communicates only with his or her superior, based on a series of rules deriving from public laws. The role of the bureaucrat remains subordinate to that of the political decision-maker and the control system implemented is rational and legal (Duncker and Humbolt, 2004).

What also changes is the role of politics, which is seen here as central to management. If the previous paradigms relegate it to a specific "area", that is, giving it the role of initial input within the management and final judgement system, the PVM sees it as central and transversal to the entire decision-making process, as it is capable of influencing the basis for cooperation by being able to change people's preferences and create an environment in which partnership is possible (Stoker, 2005). As a result, it is those involved in politics and in the network as a whole who play a leading role.

The PVM in fact focuses on the need to give greater recognition to the legitimacy of a wide range of stakeholders, meaning to refer not only to politicians and civil servants but all the actors in the network, including citizens. There must therefore be a shift from a culture that merely accepts public opinion to one that expects/relies on the active support of citizens (Stoker, 2004). The basic idea on which the PVM is based is that for a decision to be legitimate, all the parties concerned must be involved. The challenge is to find ways to involve citizens as much as possible. A winning solution, as will be discussed extensively below, can be the new information technologies that offer the opportunity for people to participate in public decisions in a flexible, active and fast way (Stoker, 2009).

The PVM, in short, can be understood as an all-inclusive approach that on the one hand mixes some characteristics of the previous approaches, while on the other hand manages to overcome the limits of the old visions, emphasizing a strong attitude towards democracy, networks, citizen engagement and proposing new ideas about the role of public managers.

Thanks to a certain conceptual affinity, it is possible to link the PVM paradigm to other post-NPM frameworks[9], such as the New Public Service.

[9] The term *post* is intended to designate a conceptual advancement and not strictly chronological.

Well, the idea that the PVM represents, to date, one of the most suitable paradigms for the management of the public sector brings with it some limitations. However, the criticisms of the approach concern only a practical level and not also a theoretical one, since the founding principles of the framework are widely shared both in the public and private sectors.

Among the most pronounced risks of the PVM, and more generally of the *governance* model, we can identify the phenomena of collusion between the government and a group of stakeholders. It is increasingly common, in fact, that even operations traditionally recognized as illegal have gained more and more ground: this is the case of cartels or collusion (Rusko, 2010).

Opening up to an enlarged network may imply that the control and implementation of public interest choices are also influenced by the private sector, which does not necessarily guarantee the interest of all the actors present in the network (Mayntz, 2001).

A further critical issue is the application of the governance model at the international level, a problem known as "governance without government" (Rhoodes, 1996).

Since, in fact, the non-hierarchical paradigm based on networks is the reference model of the European Union or of the UN system, for International Organizations the problem arises of ensuring the implementation of their policies without a bureaucratic apparatus and coercive systems typical of the national states (Borgonovi, 2008).

Because of the ambiguity of the concept of governance, most administrative reforms guided by this logic risk being pure rhetoric rather than substantive theory.

The PVM, as well as the other post-NPM, brings with it a series of practical problems that concern, for example, the measurement of the results obtained: it is problematic, in fact, to quantify the actual creation of value, or estimate the costs and benefits of the public sector, since the framework also involves non-monetary characteristics.

Unlike the NPM, the PVM seems to lack clarity as to how efficiency, accountability and fairness can be achieved, as decisions are made by the stakeholders concerned rather than by politicians who, on the contrary, are accountable for them. Stoker (2009) argues that within a democratic model such as the PVM, the best way to solve this problem and get feedback from the social partners about their choices is to involve them in public dialogue, asking them to express preferences. Such participation allows people to perceive public problems and tasks as being of interest to them, thus improving their performance.

In order to achieve efficiency, there must be continuous verification between the adherence of the activities and the related aims they are intended to achieve. As far as accountability and monitoring of negotiated objectives are concerned, the achievement of equity is achieved by developing individual capacities to realise rights and responsibilities. So, even if at first glance it is not immediately comprehensible how it is possible to achieve efficiency, responsibility and fairness, the PVM is now the paradigm that best implements the collaborative and democratic goals discussed above.

1.2.4 New Public Service

The New Public Service (NPS) is a framework based on the vision of a democratic citizenship, community and civil society within which collaborative relationships exist (Denhardt and Denhardt, 2000).

The basic thinking behind this framework can be summarised by the expression "Serve rather than steer", which designates the need for civil servants to be increasingly oriented towards shared and value-based leadership, with the aim of helping citizens to express and satisfy their common interests (Barile et al., 2017, 2016, 2015, 2012; Baccarani and Cassia, 2017; Baccarani and Brunetti, 2015; Baccarani, 1995). Such a line of thought contrasts with the attempt to control or direct society by imposing new directions on it, as was the case with past frameworks.

The key points of this paradigm can be summarized as follows (Denhardt and Denhardt, 2012):

- consideration of the target audience of the Public Administration as a citizen rather than as a group of consumers: the public interest becomes the result of a dialogue focused on shared values rather than the sum of individual interests, unlike what is claimed by the NPM. Thus, civil servants are not responsible for meeting "consumer" demand, but rather for focusing on building a relationship of trust and cooperation with and between citizens;
- pursuit of the public interest: the Public Administration must bring out a concept of public interest that is collective and shared. It is not a question of finding quick solutions dictated by individual interests, but rather of creating shared interests and shared responsibilities;
- the value of the citizen beyond entrepreneurship: achieving the communion of interests between public employees and citizens succeeds in achieving the public interest, through the contribution that both parties offer to society, better than has been attempted by considering the Public Administration as managers committed to managing public wealth;

- think strategically, act democratically: policies and programmes that meet public needs can be more effective and accountable through common commitment and collaborative processes;
- recognition of reporting difficulties: recognition must be given to the fact that in Public Administration, employees must comply with responsibilities at various levels, from state and constitutional laws, to social values, political norms, professional standards and citizens' interests;
- Offering services rather than directives: it is extremely important to direct the management of Public Administration towards supporting the needs of citizens, rather than imposing constraints on them in an attempt to control them;
- Social value, not just productivity: a focus on collaboration and the value of the individual can lead the Public Administration in the long term to achieve more stable success and more satisfactory results, while respecting the interests of all citizens.

The NPS can therefore be defined as a paradigm based on the efficiency of public service, in which the figure of the public employee plays a crucial role, which has the fundamental role of creating and maintaining relations with citizens, who become actors in a dialogue in which the voice of the community is increasingly heard.

Table 5 compares the main characteristics of NPM with the principles of post-NPM, including PVM.

Table 5: Comparison of NPM, PVM and other post-NPM characteristics

Features	NPM	PVM	NPA	NPS

Public interest	Aggregation of individual preferences, manifested through consumer choices.	Individual and public preferences (resulting from public deliberations).	Social equity: the common or shared interest of citizens.	Results of the dialogue on shared values.
Purpose of performance and associated patterns of human behavior	Management of citizens as "economic" inputs and outputs.	Multiple targets: -Service output -Satisfaction - Results -Maintenance of trust/legality/cooperation/networking.	The value is pursued through administrative actions. Citizens are members of a social and political community that includes rights and responsibilities.	Strategic logic at the political, economic and organisational levels.
Responsibility reporting	Upwards through contractual performance; sometimes outwards through market mechanisms.	Multiple: -Citizens as government officials; -Consumers as users; -contributors as lenders.	Democratic citizenship.	Multifaceted. Civil servants must respect the law, social values, political norms, professional standards and citizens' interests.
Context	Post-	Post-	Change in	Democratic

characterization	Bureaucratic, Competitive Government, Theory Inexpensive.	competitive.	administration, process orientation.	theory, a new approach to knowledge.
Recipients of the responsibility of public bodies	Consumers.	Citizens like Contributors.	Citizens.	Citizens.
Role of the public participation	Limited - except for consumer satisfaction surveys.	Crucial-facetted (customers, citizens).	Synergy between the public and private sectors.	Multifaceted: Focuses on democracy and citizens.
Objective of Management	Pursuing performance objectives.	Responding to citizens' preferences, renewed mandate and trust through quality assurance of services.	Positive, proactive and reactive administrators.	Public service, desire to contribute to society.

Source: *Adapted from Rusko (2010)*

In short, these visions present different points of contact between them and seem to be very close to the paradigm of the PVM, to the point that they can be considered valid alternatives to the same, in a renewed conception that applies the same logic of involvement of the figure of the citizen to Public Administration policies.

Both the PVM and the post-NPM focus, in fact, on three fundamental concepts: 1) the importance of networking; 2) the inclusion of citizens in public policies; 3) the multi-faceted role of public participation (Rusko, 2010). Moreover, democracy is also a guiding principle in the PVM and post-NPM, as is the emphasis on services as an important function of the public sector.

Chapter II

Open Government Data

2.1 Towards the Open Government Data: the digital transformation of PA; **2.1.1** ICTs in Public administrations; **2.1.2** Digital PA tools; **2.1.3** E-Government; **2.1.4** Multichannel management; **2.2** Dissemination of the Open Government Data; **2.2.1** Open Data in the Public Administration; **2.2.2** Origin and evolution of the OGD; **2.2.3** The principles of the OGD: Transparency, Collaboration and Participation.

2.1 Towards the Open Government Data: the digital transformation of PA

Digital Transformation is an unavoidable and global phenomenon, to which the whole Country System is trying to adapt, albeit in different ways and at different speeds. Information & Communication Technologies (ICTs) is the enabling infrastructure for modern digital transformation (Reddick, 2012), with the dual responsibility of delivering innovative, compatible and functioning solutions, on the one hand, and motivating non-digital Public administrations to evolve (Kettl, 2015).

There are many players in this system and, for the sake of simplicity, they can be grouped into four macro-categories: digital supply companies, digital demand companies, "consumer" citizens of technology and, finally, the Public Administration (Belisario, 2009).

The role of the latter is complex, given that the PA also has the institutional and pragmatic objective of stimulating the direction of digital and technological progress: innovating the PA means optimizing internal processes, whose positive impact is visible to citizens and businesses, but also be a motivating example in favor of digital culture both internally and externally, stimulating the entire supply chain of the ICTs market with positive effects at the micro and macro-economic level (Buccoliero, 2009).

This role is even more decisive in the context of the Italian productive fabric, made up mostly of small and very small enterprises, difficult to reach by cultural changes if not through costly, coordinated and widespread social and political campaigns on the territory (Liu and Yuan, 2015; Lam, 1997). This consideration suggests that digital transformation is closely linked to the local dimension of the territories, so much so that it cannot take off unless local institutions themselves adopt a culture and a mission synergistic with it.

This conviction also applies with regard to ICTs enterprises of the offer. The Italian market is made up of a majority of micro, small and medium enterprises, which create innovation and dialogue with the territory among the many difficulties typical of each market, and a small number of big players, almost all multinationals, which manage the main customers of the PA and that are able to significantly influence the system.

This triggers a perverse dynamic of subcontracting, which in recent years has caused an undignified downpricing of tariffs, undermining, moreover, the ability to innovate in small businesses (Ducci, 2007). In addition, in recent years delays, waste and inefficiencies have led to a very low use of online services by citizens and businesses, which show a low acceptance of what has been done so far (Ducci, 2015).

This was mainly due to a lack of internal *digital* skills, which prevented the PA from evaluating and contracting properly with suppliers, designing appropriate tender specifications and monitoring the development and actual implementation of projects (Danziger and Andersen, 2002). Moreover, the lack of digital skills causes an inefficiency in ICTs spending, which risks undermining the benefits that innovation should bring.

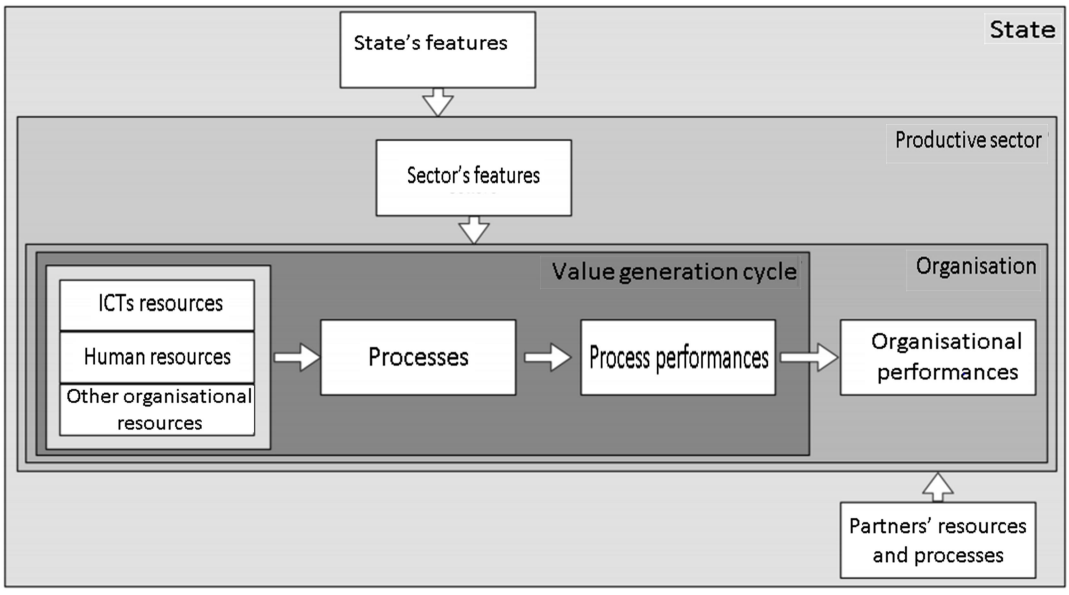
2.1.1 ICTs in Public administrations

ICTs have had a huge impact on the way individuals, groups, organisations, both public and private, work and coordinate (Van Duivenboden and Thaens, 2008). With the development of computers and the Internet, ICTs have opened wide spaces for innovation in production activities concerning the creation of new products and services, new business models and new organizational methods. Also in the Public Administration sector the use of ICTs has opened new organizational and service scenarios, enabling forms of interaction with citizens (G2C), businesses (G2B), and other public bodies (G2G), aimed at improving the effectiveness, universality, and transparency of Public Administration action (Janssen and Klievink, 2010). The application of ICTs in public and private organizational contexts generates benefits in terms of coordination, process management, costs, business opportunities and competitive advantage. The achievement of these advantages is neither automatic nor obvious. For a long time there was a discussion on the actual contribution that ICTs could make to organizations, even going so far as to completely question the possible importance of these technologies, in some cases considered as simple commodities (Matei and Savulescu, 2014). Moreover, in Public Administration, ICTs are subject to different context conditions than the private sector and the actual possibility of obtaining the expected benefits must necessarily be compared with the public

service objectives that pose new challenges but also promise new opportunities. In this regard, both the Italian government and the European Union have long been acting on the policy side to improve the diffusion of ICTs resources. For an evaluation of Public Administration activity it is useful to reflect on the impact that ICTs have on organisations. The debate on the importance of ICTs resources for productive activities and the provision of services has a significant weight in the scientific literature. Starting from the diffusion of computers in productive activities, we have tried to study the conditions in which the use of ICTs allows to generate value (Giritli Nygren, 2012).

Wanting to represent in a schematic way the fields of application of ICTs that contribute to the generation of value, it is possible to refer to the framework represented in figure 1, proposed by Melville et al. (2004).

Figure 1: Value generation process



Source: *Adapted from Melville et al. (2004)*

The value of ICTs represents a path of study and scientific research characterized by numerous moments of reflection, even critical, on the relevance and opportunity to use these technologies in productive contexts. Nevertheless, there is now a fairly widespread agreement that ICTs create value, and many commonly used tools, products and services are direct evidence of this.

According to this framework, the application of ICTs contributes to producing value at different levels, both within the organisation and in the relations the organisation has with its partners and with the external environment. In particular, it is possible to identify three main areas of reference: the individual organization, the production sector and the national context. At the level of the individual organisation, the first area of application of ICTs concerns processes. At this level, a heterogeneous set of resources, divided between ICTs resources, human resources and other complementary resources, interacts with the activities of business processes. This interaction helps to improve the performance of the processes, producing numerous advantages, such as flexibility, speed, traceability, accuracy and increase of the information transmitted and exchanged. Improving the performance of a process can lead to improvements in organizational performance, producing benefits such as productivity, efficiency, competitive advantage, increased profit and market value.

Every single organization lives in a symbiotic way with the external environment. Within this environment, the organisation interacts with other partner organisations. ICTs can also contribute to generating benefits for the organisation in its interactions with partners, especially when goods/services are provided in a collaborative manner, thanks to the interaction between multiple processes in the supply chain (Meijer et al., 2012).

The benefits that ICTs can produce for organisations collaborating in the environment also depend on the characteristics of such interaction. In particular,

the productive sector and its specificities can create more or less large areas of application of ICTs and, consequently, can give rise to the concretization of greater or lesser benefits from their application (Sandor, 2012). The dynamics of inter-organisational collaboration described so far are specific to the production sector. At a broader level, however, there are other factors that influence the ability and opportunity for organisations to derive value from ICTs resources (Misuraca and Viscusi, 2011). At the level of a single nation or supranational area (such as the European Union), aspects such as policies on the use of technology, the presence or absence of technological resources (both technical and human), the level of development, culture, education and investment in research are all able to influence the current possibility of organizations to gain value from the use of ICTs (Meijer et al., 2013).

The Public Administration context differs profoundly from the private context and, for these reasons, the application of ICTs and the possibility of exploiting their created value also require specific attention. There are many cases showing that the application of ICTs to the public sector requires more attention than to the private sector (Șandor, 2012). The Public Administration, in all its articulations, is subject to rules (e.g. in purchasing and/or in human resources management) or to additional obstacles and difficulties (e.g. cuts in expenditure or the blocking of turnover in times of economic crisis) that are not alter-ego in private organizations. Moreover, the work of the Public Administration has an impact on the private sector, in particular on its social and political dimensions, which is not the case for private sector organisations (Snellen, 2012).

Public organisations in their action depend heavily on the choices of financing and budget allocation. Moreover, these organisations rarely operate for profit, and even when they do, they do not distribute it among their shareholders (Mašović et al., 2011). Public organisations pursue a mix of objectives, some of which are conflicting, and must interact with different stakeholders with demands that are

not always compatible. Public organisations must be accountable for their service delivery activities to various actors, including of course central government, local government, parliament and citizens. Moreover, in their work, public organisations must necessarily balance general principles such as impartiality, stability, universality and continuity in the provision of their services (Bekkers et al., 2006). All these aspects mean that the implementation of ICTs in Public administrations, in order to be able to produce value, must follow specific logic and solutions and not borrowed from the private sector.

Another important element regarding the application of ICTs in Public Administration concerns the action of policy makers, who are in the best position to create the necessary conditions for the profitable exploitation of technologies (Meijer, 2007). With regard to the role of policy makers in the development of ICTs in the public sector, in the Italian context, in addition to the role of the national government, the action taken by the European Union is obviously also relevant. In particular, the European Commission has recently presented the Digital European Agenda which contains the strategies and main lines of action for the dissemination of ICTs in Europe (not only in the public, but also in the private sector). This agenda includes measures, including legislative measures, which are part of the broader Europe 2020 strategy and which aim to:

- a new single market to reap the benefits of the digital age;
- an improvement in the definition and interoperability of ICTs standards;
- an improvement in the rate of confidence and security in the Internet;
- increased penetration of broadband technologies;
- an increase in research and innovation;
- the dissemination of e-skills and accessible online services to all European citizens;
- the exploitation of the potential ICTs for the benefit of society;
- the realisation of a European digital strategy.

With this agenda, the first flagship initiative of the Europe 2020 Strategy, the European Commission intends to promote the creation of a single digital space within the European Union. In this space citizens would be free to move and use digital services, both in their interaction with private companies and with the public sector (Di Natale et al., 2003). At the same time, the European Union seeks to reduce the barriers that would prevent the deployment of ICTs and the full realization of their benefits, with interventions aimed at addressing the issues of the digital divide, security, and the strengthening of ICTs skills.

From the national point of view, ICTs in Public Administration have been a commitment of government actions aimed at a progressive but steady diffusion of these technologies in the organizational structures and administrative procedures of both central and local Public Administration. The first regulatory interventions in the field of ICTs in Public Administration date back to the early 90s through the introduction of mechanisms for computerizing public offices (Leonetti, 2009). ICTs in the Public Administration have seen since the 1990s the presence of a central public institution with the role of promoting, coordinating, planning, and controlling their development. This institution was established by Legislative Decree 39/1993 with the name of Authority for Information Technology in Public Administration (AIPA), later transformed into the National Centre for Information Technology in Public Administration (CNIPA) with Legislative Decree 196/2003, DigitPA with Legislative Decree 177/2009 and, finally, the Agency for Digital Italy (AgID) with Legislative Decree 83/2012 converted into Law No 134/2012.

AgID was born from the merger of DigitPA with the Agency for the diffusion of technologies for innovation and the Department for Digitization and Technological Innovation of the Presidency of the Council of Ministers. The transformation also saw the transfer of part of the original functions to Consip. AgID is responsible for coordinating ICT skills across different Public Administration bodies, facilitating innovation in the public sector, and monitoring

the process of digitisation and modernisation of Public Administration. The final objective of the activity carried out by AgID is the realization of the Italian Digital Agenda, which collects specific objectives for ICTs in Public Administration, and which has numerous points of contact with the European Digital Agenda. Specifically, the agenda aims to:

- the development and diffusion of ICTs for Public Administration;
- improving interoperability between Public Administration IT systems;
- ensuring an adequate level of service quality;
- coordination of the various initiatives for the digitisation of public services;
- rationalisation of ICTs expenditure in the Public Administration.

The use of ICTs in the Italian Public Administration has seen progressive progress with legislative measures that have followed one another over the years. An important step consists in the enactment with Legislative Decree 82/2005 of the Digital Administration Code, with which the legislation on ICTs in Public administrations has found a moment of reorganization and reorganization. With the entry into force of the Code in January 2006, new digital tools were introduced to improve the effectiveness and efficiency of Public Administration, while giving them legal validity. Among the innovations introduced by the Code there is also the identification of new digital rights for citizens, including the right to use digital technologies in all relations with the Public Administration. This right extends to access to all documents, acts and procedures in digital format, and provides for the execution of any form of payment to Public administrations and the participation of citizens in democratic processes and in the exercise of political and civil rights (individual and collective) through digital channels. The Code was then subject to subsequent revisions and innovations (Legislative Decree 201/2011, Legislative Decree 6/2012 and Legislative Decree 179/2012), which introduced additional aspects relating to:

- adoption of free or open-source software;
- simplification and dematerialisation through the telematic transmission of documents between Public administrations and between Public administrations and private individuals;
- introduction of digital domicile for every citizen (consisting of his certified e-mail address);
- the obligation for Public administrations and companies in which public bodies have an interest to use digital channels and services exclusively for certain types of acts from 1 January 2014.

The regulatory interventions and the convergence path of the Digital Agenda for Europe have seen progressive improvements in the diffusion of ICTs in the Italian Public Administration, which however needs further efforts. Most of the interventions carried out in recent years have been mainly directed at the infrastructural endowment of Public administrations, especially with reference to local Public administrations. This action is a necessary consequence of Italy's delay in developing critical infrastructures for digitisation (Di Natale et al., 2003).

The information related to the diffusion of ICTs in the Public Administration allows to appreciate an effort mainly oriented to the improvement of the infrastructural endowment. Under the impetus of the European and Italian Digital Agendas, in the last three years the diffusion of some key technologies for the innovation of the delivery of Public Administration services and for the relative improvement of efficiency has increased (Leonetti, 2009). From the point of view of the control room of these initiatives, the institutional responsibility for controlling and directing the digitization of the Public Administration has seen numerous changes and shifts of responsibilities between different bodies. Overall, while the action taken so far has contributed to increasing the spread of some important technologies (such as Certified E-mail), the contribution of innovation in terms of new services to citizens or alternative ways of delivering them still has considerable room for improvement.

This innovation is faced with organizational difficulties arising from different contexts, especially at the level of local Public Administration, where there are bodies of different sizes and spending power, but with similar skills even if on different territories. In addition to an action aimed at infrastructural aspects, although necessarily relevant, it is also important to intervene on organizational environments, processes and complementary resources since ICTs resources, to generate value, must be immersed in an organizational environment in which they operate in a symbiotic manner with other complementary resources. For an activation of infrastructural investments in ICTs that has an impact on the work of the Public Administration and on the services offered to the citizen, it will therefore also be important to take action on the organisational and process front, rethinking the logic of interaction between the Public Administration and the citizen/enterprise, but also between different bodies of the same Public Administration.

2.1.2 Digital PA tools

With the "e-government plan 2012" and the new "Digital Administration Code" (CAD), the theme of the use of information and communication technologies in the Public Administration is dealt with in an organic and complete way. Rules, regulations and tools are established to guarantee the management, access, transmission, preservation and usability of information in digital format using the most suitable technologies within the Public Administration.

Of course there are many opportunities and possibilities offered by new technologies (Brown, 2013; Austin and Callen, 2008) and several more or less innovative tools available to administrations that are called to become "digital administrations" (Austin and Callen, 2008; Charalabidis, 2010).

The issue of the dematerialization of documents produced within the scope of the activities of the Public Administration has been at the centre of the action of the Reform of the Public Administration for some time now. In particular, the use of the most innovative technologies to achieve the definitive elimination of paper has found a place of great importance with the introduction of CAD (Digital Administration Code) in 2005 where art. 42 explicitly refers to the concept of dematerialization. Art. 42: "Public administrations shall assess, in terms of cost/benefit ratio, the recovery in electronic form of documents and paper documents whose preservation is obligatory or appropriate and shall provide for the preparation of the consequent plans for the replacement of paper archives with electronic archives, in compliance with the technical rules adopted pursuant to article 71.

Moreover, the progressive elimination of paper, through the computerization of processes, allows to simplify the relationships between PA and citizens and businesses and is one of the priority objectives contained in the e-gov 2012 Plan.

It is well known that paper-based document management processes are characterized by being expensive, having a strong environmental impact, lack of transparency, difficult sharing and archiving, high search times, ease of error, loss, etc. (Smorgunov, 2016; Hasnain, 2017). The term dematerialisation therefore indicates the progressive increase in computerised document management within the Public Administration and the replacement of traditional administrative documentation supports in favour of the computerised document (the Digital Administration Code - Legislative Decree no. 82 of 7 March 2005 - defines the computerised document as "the computerised representation of legally relevant acts, facts or data"). In this sense, the concept of "dematerialization" can be considered as the extension to the P.A. of the general tendency to use ICTs tools for the automated processing of information (Panfili, 2008).

The objectives of dematerialization are twofold: on the one hand, criteria are adopted to avoid or significantly reduce the creation of new paper documents; on the other hand, the aim is to eliminate the paper documents currently existing in the archives, replacing them with appropriate computer records and discarding documentation not subject to protection for its historical and cultural interest (Incontro, 2018).

The full success of the process of dematerialization is also guaranteed by the diffused and systematic application of all those instruments available to guarantee the authenticity of the documents and to the adoption of univocal and detailed classification systems (Fang, 2002) which include procedures for the conservation and selection of the documents (Islam, 2012).

The following are some of the tools highlighted by the inter-ministerial working group on the dematerialisation of administrative documentation.

- IT protocol: the Legislator defines the IT protocol as "the set of computing resources, equipment, communication networks and IT procedures used by administrations for document management", i.e. all the technological resources necessary for the creation of an automatic system for the electronic management of document flows (Arrabito et al., 2000; Grandi et al., 2003). This definition is contained in the Consolidated Text of the legislative and regulatory provisions on administrative documentation (Presidential Decree 445/2000, art.1). This legislation contains the indications to which each computer protocol system that is to be adopted or implemented must conform in the context of "training, release, maintenance, storage, management and transmission of acts and documents by Public Administration bodies". The activity of protocol is that phase of the administrative process that certifies the origin and date of acquisition of the document by uniquely identifying it through the affixing

of numerical and temporal information (Lupoli, 2004; Doria, 2005). It is therefore an obligatory step for all the documentary flows between and within Administrations (Fragiacomo, 2013; Antolini, 2001). The degree of efficiency and transparency achieved by administrative action depends on its innovative and rational management (Antolini, 2001; Cammarata, 2009). The objectives to be pursued with the tool of the "computer protocol" are (Franchi, 2008):

- eliminate paper records;
- to reduce the number of protocol offices;
- rationalise the flow of documents;
- to implement the instruments that favour an effective exercise of the right of access to the state of the proceedings and to the relative documents by the interested parties (citizens and businesses) in order to improve the transparency of the administrative action.

With the Decree of 14/10/2003 the Guidelines for the adoption of the computer protocol and for the computer processing of administrative procedures are approved. The guidelines provide a unified picture of the minimum requirements that administrations have to meet and that they are, in a nutshell,:

- definition of an adequate plan for the development of automated information systems with identification of the homogeneous organisational areas and the relative offices;
- appointment of the heads of those services;

- drafting and adoption of a manual for the management of the documentary system;

- introduction of a computer system for document management that includes at least the minimum core of the computer protocol.

The CNIPA (Centro Nazionale per l'Informatica nella Pubblica Amministrazione) has drawn up a reference model for the Management Manual (the result of an analysis of the management manuals received by CNIPA and/or published by the individual central and local administrations) for all the administrations that carry out electronic document management projects with some operational indications for the drafting of the Management Manual for the IT Protocol, documents and Archives that the Public administrations are called upon to prepare pursuant to art. 3, paragraph c) of the Prime Minister's Decree of 31 October 2000.

In 2009, the CNIPA, pursuant to Legislative Decree no. 177 of 1 December 2009, took on the name of DigitPA. Subsequently, pursuant to Legislative Decree no. 83/2012, converted into law no. 134/2012, the DigitPA was abolished and the Agency for Digital Italy was established.

- Digital signature: The digital signature represents the electronic equivalent of a handwritten signature, as it guarantees the authenticity and integrity of the document/message (Battistella and Zimuel, 2010; Buonomo, 2004). The difference between the handwritten signature and the digital signature lies in the fact that for the former the authenticity is linked to the handwriting of the person who signs, while for the latter the authenticity derives from the exclusive and non-transferable possession of a computer tool by the signatory (Ciacci, 2000; Finocchiaro, 2007).

The digital signature is a particular type of qualified electronic signature (Piccoli and Zanolini, 2000), as can be seen from the classification of the different types of electronic signature provided both by the Legislative Decree no. 10 of 15 February 2002, implementing the EC Directive No. 93 of 1999, and by the Regulation of coordination on electronic signatures (Presidential Decree 137 of 7 April 2003), based on an IT procedure: to generate a digital signature it is necessary to use a pair of asymmetric keys (double key encryption method) provided to the holder of the signature. The first key, private, is used to sign the computer document, while the second, public, is used to verify the authenticity of the signature. Security is guaranteed by the impossibility of reconstructing the private key from the public one, even if connected.

The IT procedure ensures that the signature is uniquely connected to the signatory, created by means over which the signatory can retain sole control, and linked to the data to which it relates in such a way as to make it possible to detect whether the data itself has subsequently been modified.

The digital signature is a tool that does not allow to modify a document or to extrapolate the signature and attach it to another object and that prevents the author from denying ownership (Navone, 2008).

In short, the requirements for a digital signature are:

- integrity, i.e. the certainty that the document has not been tampered with or modified after its signature;

- authenticity to guarantee the identity of the signatory.

The digital signature is issued by a Certification Body, that is by a public or private, accredited and authorized, which has the task of ensuring the security of the signature. The list of these subjects, subject to the supervision of the CNIPA, is, by law, published on the Centre's website.

All natural persons: citizens, administrators and employees of companies and Public administrations, can equip themselves with a digital signature. To obtain a digital signature, it is necessary to contact accredited certifiers, who have obtained authorisation to carry out this activity.

The objectives of the digital signature are (May and Zangara, 2008):

- the elimination of paper supports and the streamlining of the activities carried out, through the enhancement of the electronic management of document flows to improve administrative efficiency;
- improving administrative transparency;
- the enhancement and strengthening of online institutional communication and electronic communication tools, such as computer protocol, certified e-mail, electronic identity card;
- the increase in the online delivery of services by the Public Administration and the possibility of allowing its users to carry out transactions, in line with government e-government plans;
- the development of more secure and transparent IT and telematic procedures to guarantee the correctness and legal validity of the operations conducted;

The digital signature is one of the fundamental components of the IT management of administrative documentation and represents one of the

cornerstones of the e-government process (Battistella and Zimuel, 2010; Buonomo, 2004). This tool makes an important contribution to the process of digitizing administrative procedures, in the computerized management of document flows and processes, in the elimination of paper documents (dematerialization of the administrative process). The digital signature, allowing the verification of the identity of senders and recipients in the exchange of original documents within Public administrations, offers the possibility to carry out procedures online, speeding up and streamlining administrative action and simplifying the lives of citizens (Ciacci, 2000). The Public Administration is, in fact, obliged to accept digitally signed documents.

There are now many applications that use digital signatures in Public Administration (Finocchiaro, 2007). These are involving multiple actors: businesses, with the obligation, for example, to transmit financial statements electronically to the Chambers of Commerce; public bodies, with the process of dematerialization; citizens, with the ability to send requests and statements to the Public Administration in electronic form.

- Electronic identity card: the Electronic Identity Card (EID) is a complex tool, useful as a personal identity document able to respond to the need to allow secure identification in both the physical and virtual world (Picchio, 2001; Giusepponi, 2009). The redundancy of the computer supports required by the current conformation of the Electronic Identity Card for the storage of data, contained both on the visible or printed part of the paper and on an optical band and a microchip, make it an object of difficult technical and organizational management, which is delaying its diffusion (Quaranta, 2006; Lisi, 2009). In essence, it is a smart card that integrates an optical band and a microprocessor into the polycarbonate support. More specifically, the data of the holder, including the photo, are

visibly imprinted both on the physical medium (for "visual" identification) and on the optical band. On the microchip it is also possible to host data entered by Public administrations to access the qualified services implemented by them, as well as digital signature certificates. The services that require the storage of data on the card may be municipal or national (Manenti, 2005). Municipal ones can be prepared in full autonomy from the municipalities, while for national ones an authorization from the Department of Public Administration is required (Masucci, 2003; Rey, 2000).

The Electronic Identity Card has several objectives (Iadicicco, 2001; Martoni, 2008):

- increased security in the process of identification for police purposes;
- use as a networked identification tool for telematic services;
- complete interoperability throughout the national territory.

- National Service Card: the National Service Card (CNS), like the Electronic Identity Card, is one of the tools that allow certain identification on the web and the possibility of using the online services offered by the Public Administration (Masucci, 2003). Originally, the National Service Charter was designed to allow the use of numerous services provided by public bodies. The National Service Card can perform the same functions as the Electronic Identity Card, with the exception of "visual" identification, but it implies computer and security features more appropriate to the reality of most Italian administrations (Di Maria and Micelli, 2004).

E-government policies recognise the fundamental importance of the possibilities offered by these two new technological tools, from the point of view of innovation, the modernisation of the public system, but above all the greater transparency and simplification of administrative procedures, since they allow every citizen to interact fully with any body without having to go to the counters in person (Cammarota, 2002; Lisi, 2009). In the same way, they also influence communication within and between agencies, since public employees in charge of proceedings can digitally affix signatures or stamps, making themselves recognized as authorized subjects. The same administrative procedures can benefit from faster and more secure data transfer times and methods. Only Public administrations, of any order and degree, may issue the National Service Charter. The Public Administration that intends to issue the National Service Charter is responsible (Martoni, 2008; Di Giorgi, 2003):

- the correctness of the identification data and tax code stored in the card and in the authentication certificate;
- the security of the authentication, initialization, distribution and update/withdrawal phases of the card.

The National Service Card is a microprocessor card issued by the Public Administration, with which citizens, through a single technological standard, can access, from anywhere, the services offered on the network. This card, a true digital "passe-partout", contains all the identification data of the person, except for the photo of the holder, which allow, through a personal numerical code, certain and secure identification and immediate access to the services provided on the network (issues of authorizations, changes in personal data, etc.).

Identification is made possible thanks to digital signature technology and the insertion of the card in a special reader connected to the Internet. This smart

card, not being an identification document, allows the use of flexible forms in the production and delivery phase of the same. In addition, all CNS are designed to operate as a health card, thus allowing citizens to connect to the network with health facilities to access the services offered (booking services, search reports, etc..).

The National Service Card allows (Rabbito, 2008):

- the functionalities of the digital signature;
- the use of network services by the cardholder, through a certificate of card authentication, which in combination with the user PIN, allows the functions of recognition in the network;
- computer payments through appropriate memoranda of understanding between Public administrations, banks and the postal service
- the functionalities of the health card (optional function)

- Certified E-mail: Certified E-mail (PEC) is an e-mail that guarantees the time and date of dispatch and receipt, origin and integrity of the content (Pelosi, 2007; Draper-Gil et al., 2014). The PEC allows you to send and receive messages with the same legal value as a registered letter with acknowledgement of receipt. With Presidential Decree no. 68 of 11 February 2005, containing the regulations concerning the provisions for the use of certified electronic mail, the legal validity of documents sent by electronic mail is recognised. Certified e-mail and digital signatures must be used for communications that need to be sent and delivered in order to identify the sender with certainty. The PEC acquires legal value thanks to the fact that the transmission of the message and the reception by the recipient are certified by the certified e-mail operators of the sender and the recipient, through the "acceptance receipt" produced by the first and the "delivery receipt" produced by the second.

The process of sending and receiving the certified e-mail message is as follows: the sender sends the message to his PEC manager who forwards the acceptance receipt and simultaneously sends the message to the recipient's mailbox directly (if the manager is the same) or to the recipient's manager, ensuring the interoperability of the services offered.

As with a registered letter with acknowledgement of receipt, a PEC is deemed to be "received" by the addressee if it is delivered in the mailbox (this is evidenced by the receipt sent by the addressee's mailbox operator), whether or not it has been read. The receipts issued by the mail operators are also signed by them by means of an advanced electronic signature, automatically generated by the mail system and based on asymmetric keys in pairs, one public and the other private, thus ensuring the origin, integrity and authenticity of the certified e-mail message.

In Circular No. 1 of 2010 of the Department for the Digitization of Public Administration and Technological Innovation (DDI), it is stressed the need to use new computer channels in order to increase the degree of computerization and digitization of administrative processes and to make more transparent and effective public action. The circular highlights the importance of communication through PEC as an easy and secure system for interaction between Public administrations, citizens and businesses. The Certified Electronic Mail is given particular importance within the PA, for the guarantee of quality, traceability and security that it offers.

The Prime Minister's Decree of 6 May 2009 "Provisions on the issue and use of the certified electronic mailbox assigned to citizens" defines the method of activation of the PEC and the obligations for Public administrations in this regard, already provided for in the Digital Administration Code (art.6 and art.47) and in Law 2/2009 (art.16 and

art.16 bis). Article 4 of the above mentioned Prime Minister's Decree states that Public administrations "shall set up a PEC box for each protocol register and notify the CNIPA (now called DigitPa), "shall make available on their institutional website, for each procedure, any type of information suitable to allow the submission of applications by citizens holding PECs, including the time required for the completion of the procedure"; the PAs shall also "accept the applications of citizens sent through PEC" in accordance with Article 65 of the Digital Administration Code.

In summary, following the provisions of the various provisions on the subject, Public administrations are obliged to (Petrucci et al., 2011; Carullo, 2016):

- to have a PEC box for any exchange of information and documents (Article 6 of the Digital Administration Code);

- to have a PEC box for each protocol register (art. 47, paragraph 3 of the Digital Administration Code and art.16, paragraph 8, law 2/2009);

- communicate to DigitPa the certified e-mail addresses established for each protocol register (art.16 comma 8 law 2/2009 and art.4 DPCM 6 may 2009)

- use the PEC for any exchange of documents and information with all interested parties who request it and who have previously declared their e-mail address (Article 6 of the Digital Administration Code);

- publish on the initial page of the institutional website the address of PEC to which the citizen can turn for any request (art.54 Code of digital administration and art.34 of Law 69/2009) and make available

on the site for each procedure the information necessary to allow the submission of applications by citizens (art.4 DPCM 6 May 2009);

- define the methods of allocation by agreement with the Department For Innovation and Technology (now DDI) or with the assignee of the service - of the box of PEC to its employees and to use the PEC for communications and notifications to civil servants (art.16 bis Law 2/2009 and art.9 DPCM 6 May 2009);

- connect the system of protocol and management of documents (in accordance with the Prime Minister's Decree of 31 October 2000) to systems suitable for transmitting and receiving documents also through PEC (Circular No. 1/2010 DDI);

- disseminate their addresses of PEC, as well as on the institutional website, through other channels of communication with the citizen (Circular No. 2/2010 DDI);

- equip itself with tools for affixing a digital signature to the documents to be transmitted in the cases provided for by law (Circular No. 1/2010 DDI);

The implementation of the dictates concerning the activation and use of the PEC is relevant for the purposes of measuring and assessing organizational and individual performance as provided for by Legislative Decree 150/2009. As far as the dissemination of PEC addresses communicated by Public administrations to DigitPa is concerned, DigitPa is obliged to make PEC addresses available electronically (art. 4 DPCM 6 May 2009 and art.16 law 2/2009). These addresses are available in the computer archive available on the website www.indicepa.gov.it. Under Law No. 2/2009, companies and professionals must also have a PEC.

With the decree of the President of the Council of Ministers of 6 May 2009, the procedures for the issue of the PEC box to citizens were defined, as provided for in Article 16 bis, paragraph 5 et seq. of Legislative Decree No. 185/2008, converted into Law No. 2 of January 2009. Article 2 of the decree states that "to citizens who request it, the Department for Innovation and Technology (now called the Department for the Digitization of Public Administration and Technological Innovation in accordance with the Prime Minister's Decree of 28 April 2009), directly or through the assignee of the service, assigns a certified e-mail address.

The modalities of request and activation are defined in the annex of the above mentioned DPCM. They can request the activation of a box of PEC for free, all citizens of age, including those residing abroad. The request can be made through the site specially created by the DDI PostaCertificata on which you can also consult the documentation and detailed information on the PEC. After filling in the online application form, it is necessary to go to the authorised territorial offices (the list of offices is available on the thematic website).

The box, issued to the citizen in accordance with Law No. 2/2009, allows communication only with the Public Administration - there is no provision for the exchange of information between citizen and citizen - and allows the sending of computer documents electronically with legal validity. Through the PEC it is possible to request information, send requests and documentation, receive communications and documents. By requesting and activating the PEC box, the citizen accepts the sending by the Public administrations of all the measures and acts that concern him. It is possible to withdraw from the service at any time (Buzzi et al., 2016; Ferrer-Gomilla et al., 2010; Cailloux et al., 2006).

2.1.3 E-Government

The term "e-government" is intended to define the digitized management system of the Public Administration, aimed at allowing, together with procedures of an organizational nature, the processing of documents, the evaluation of applications and, in general, the entire management of procedures with computer systems (Bonsón et al., 2012). Through the widespread use of ICTs, e-government makes it possible to optimize the work of institutions and to offer users (citizens, businesses or even the public authorities themselves) faster services, for example, through websites, telephone, fax, smartphone, Bluetooth, and so on.

The objectives pursued by e-government are effectiveness, efficiency, economy, transparency and democracy in the delivery of public services and in the conduct of administrative procedures (Carter and Bélanger, 2005). In short, e-Government aims to improve the performance of the administrative machine through the digitization of processes, with greater simplification (fewer steps and documents for both public employees and users-citizens), cost-effectiveness (reducing costs and the commitment of human resources) and timeliness (reducing the time of processing and delivery of services).

The information flows through which the Public Administration provides services may have 3 different types of recipients (Bertot et al., 2010):

- consumers as citizens (G2C);
- enterprises (G2B);
- other public bodies (G2G).

Very often the concept of e-government is used alternatively with the concepts of 'online administration' or 'internet-based administration', as it involves the use of many specific online technologies, such as m-government (mobile government), u-government (ubiquitous government) and g-government (e-government

GIS/GPS applications), or generic, such as online community structures, newsgroups, electronic mailing lists, online chat and instant messaging technologies (Tolbert and Mossberger, 2006). However, this does not mean that there is no use of non-linear, i.e. non-Internet-based technologies such as telephone, fax, handheld, SMS, MMS, GPRS and Bluetooth.

The use of technology in the Public Administration favours the diffusion of concrete benefits both for the users of the public services and for the administrations themselves, such as better interoperability, less bureaucratic rigidity of the procedures, greater efficiencies determined by the minimization of waste (Yildiz, 2007).

On the other hand, however, there are also problems related to the use of technological instruments, especially in terms of security of data stored and exchanged. This aspect makes it necessary to equip it with state-of-the-art security devices (passwords, digital signatures, etc.), in order to avoid unwanted access to information.

The development of the e-government project is part of the broad process of innovation and reorganization of the Public Administration that began in the 90s as part of the administrative reform of the Public Administration and that has set itself the goal of modernizing the PA through greater efficiency, transparency and administrative simplification, improving the quality of the relationship with the citizen (Heeks and Bailur, 2007).

In general, e-government is recognizable as the use in administrative processes of information technologies (more generally ICTs, Information Communication Technology), introduced with the aim of providing services that meet the new needs expressed by a society profoundly changed in recent years, in articulation and lifestyles (Bélanger and Carter, 2008). In addition, the introduction of a new working tool was perceived as an opportunity to address the reorganization of the

bureaucratic process to reduce the complexity of the system, to the benefit of both internal and external users.

It should be stressed that e-gov does not only coincide with the general computerization and digitization of the Public Administration, but it is correct to speak of e-gov when the use of innovative technologies clearly constitutes a valid contribution to the improvement of the final services rendered to users (Andersen and Henriksen, 2006).

Therefore, e-government or digital administration means the use of information and communication technologies (ICTs) in the administrative processes through which the PA aims to make more efficient the action of the Public Administration, improving on the one hand, the quality of public services provided to citizens and decreasing on the other hand, the costs for the community (Gil-García and Pardo, 2005; Sá et al., 2016).

The introduction of innovative processes related to e-gov has necessarily changed, in a way that is profoundly different from the traditional, the type of interaction between administration and citizen and/or business (Reddick, 2005; Nica, 2015). The user and his needs are placed at the heart of the administrative action and it is up to the administration to reorganize in technological terms the back office processes that prepare the online delivery of the final service.

Putting the user at the centre of administrative action is essential both to reorganise the administrative activity dedicated to services and redirect it (Ebbers, 2017; Evans, 2017), and to promote success for the services provided online. In essence, for citizens who use the services offered through alternative channels to the traditional ones, the feeling of enjoying clear and concrete advantages must be precise (Lee et al., 2005; Al-Hujran et al., 2015).

The process of change driven from the outside, is accompanied by the more complex change that many PA also propose within the organization, motivated by internal efficiency needs of an organizational type and especially of an economic type (Illiano et al., 2017). In recent years, the reorganization of the back office process has been particularly important, since it involves not only multiple offices of the same administration, but also offices of different administrations, providing appropriate tools for cooperation between processes and services of different entities (Rana and Dwivedi, 2015).

In summary, the contribution of e-government to Public Administration generates the following advantages (Venkatesh et al., 2016; Ebbers et al., 2016):

- administrative efficiency of the PA;
- Interoperability between administrations;
- transparency of procedures;
- access to on-line services of all Public administrations and services;
- 24-hour availability;
- reduction of costs and time;
- equal treatment for all citizens.

The current e-gov Plan defines the strategic areas and a set of digital innovation projects to be pursued. The starting point is to complete the application of the Digital Administration Code, both through a better use of existing IT equipment and with new ICT investments, which, in addition to improving the quality of services provided to citizens and businesses, allow a significant reduction in administrative burdens (Schnoll, 2015). The original CAD (Digital Administration Code), the term commonly used to describe Legislative Decree no. 82 of 7 March 2005, has been updated and integrated with the text of the NEW CAD, Legislative Decree no. 235/2010, published in the Official Gazette of 10 January 2011, Suppl. Ord. no. 6. Together with the CAD, the legislative framework is completed by the Legislative Decree of 30 June 2003, which regulates the processing of personal

data also through electronic means, and the Law of 9 January 2004 no. 4 (also known as the Stanca Law), relating to the access of disabled people to IT tools for the expansion of digital inclusion policies.

2.1.4 Multichannel management

The increase in the complexity of the information to be provided and of the services to be provided, as well as the heterogeneity of the public with which the Public Administration is confronted, imply the need for a differentiation of the channels of contact with users (Ducci, 2015). Public administrations can respond to this need through the multi-channel strategy. Multichannel can therefore be defined as the combined use of multiple channels to create relationships, dialogue with the citizen/user and offer services (Wirtz and Langer, 2017). The strong push towards multichannel is due to the development of new technologies that have made available to PA and citizens a variety of communication tools.

Multichannel, however, should not be understood only as "use of different channels", but as a real strategy of relations with users, a strategy that can be implemented effectively if preceded by an assessment of the target audience, services and information to be made accessible, the type of relationship with the user, the existing tools and channels (Gagnon et al., 2010). In fact, multichannel communication planning is fundamental: communicating according to a strategic plan allows to choose and use the tools in the most effective and efficient way, to use resources in view of defined objectives, to create continuity in relations with citizens.

The public body that adopts a multi-channel logic offers users the opportunity to access information and services through different and multiple tools, from the computer or the counter, from the mobile phone to the public portal. By adopting

a multi-channel approach, it is possible to effectively address the growing need to communicate from anywhere, at any time and by any means, and above all to satisfy the various categories of recipients (Lenk and Traunmuller, 2001). Through the differentiation of the channels available to the user, the aspect of personalisation of the service is also strengthened.

Multichannel is a key element for the success of the provision of public services, for an effective management mode and for the monitoring of the services offered, from a Citizen/Customer Relationship Management (CRM) point of view, that is, from a point of view that puts the citizen and the relationship at the centre of administrative action (Lenk and Traunmüller, 2002). Multichannel is to be understood in a bidirectional way: in the provision of services and dissemination of information and in the reception of messages by the user. From this point of view, multi-channel is, therefore, an important step for the progressive development of the Public Administration/user relationship on the road to the quality of the relationship, but also of e-government and e-democracy (Gil-García and Luna-Reyes, 2006).

Although multi-channel is based on the possibility of using and combining different channels and tools, it is not limited to them: it represents a systemic approach to the management of communication activities (Teerling and Pieterson, 2011). PA as a multi-channel (and digital) administration offers integrated services, available anywhere, easily and in real time. Multichannel is not limited to the multi-channel portal (although today this is the most widespread application) and is not only linked to the implementation of online services, but concerns the application of different technologies in the field of both back office and front office (Klievink and Janssen, 2010).

The work of organising and integrating the multi-channel offer is, in fact, carried out at the back office level (Ducci, 2015). It is not only a question of

implementing communication channels or choosing tools, but also of producing content that is appropriate to the specific characteristics of the medium with which it will be disseminated. Moreover, the repetition of contents and services on more than one channel cannot be indiscriminate, but must be dealt with in a reasoned and planned way (Wirtz and Langer, 2017).

A multi-channel front office requires "multi-access" databases, technological platforms that can store, organize and coordinate the data and information produced by the institution, and make such content multi-accessible. The multi-channel front office must allow administrations to provide equal services on multiple access channels, both physical and virtual, so as not to exclude citizens not connected to the Internet. It must therefore ensure the development of accessible information services for the citizen regardless of the technology available to him and, in this sense, multi-channel can solve the problem of the digital divide (Gagnon et al., 2010).

The combination of the various channels is variable geometry. It is important to consider that the user prefers to relate with people, prefers ways received as usable, therefore easy, simple, that give a feeling of pleasantness (Lenk and Traunmuller, 2001). It is therefore necessary to re-evaluate the direct relationship, the face-to-face relationship, which as a result of the significant progress in technological development and the search for innovation even within the PA, is likely to be lost in favor of a "central internet vision". If the channel is not supported by an operator, it can be equipped, for example, with "accessories" to help, allowing the user to solve doubts or ask for explanations. These "safety outputs" can range from simple telephone numbers or self-monitoring and validation tools to more sophisticated types, such as real-time chat (Lenk and Traunmüller, 2002). Therefore, it is preferable to use the channels that make available to the user all the steps that lead to the successful conclusion of the search for information or the use of a service.

The choice of tools, within the framework of communication planning, is part of the operational phase of the design and takes place downstream of the entire strategic phase, i.e. when the communication objectives have been defined, the analysis of the contexts has been carried out and the relevant publics have been identified (Gil-García and Luna-Reyes, 2006). The choice of tools follows the definition of communication targets, of the contents to be conveyed and of the methods of relationship evaluated as more effective than the targets and contents. Moreover, in the choice of tools and their use to relate and communicate with users, it is essential to evaluate the characteristics of the tools themselves, their quality and criticality, their strengths and weaknesses (Teerling and Pieterson, 2011). It is advisable to consider the diffusion of the different communication supports, in relation to the target audience. The criteria that can be followed in choosing a channel and an instrument can be for example: accessibility, attractiveness, flexibility and adaptability to the message/service, cost/benefit ratio, innovativeness, mode of use, diffusion of the instrument and space-time coverage (Klievink and Janssen, 2010). The tools available to PA, can be divided into traditional and digital, physical and virtual. A distinction between the various types of channels is whether or not they are in contact with an operator, either directly or indirectly.

A further distinction of instruments can be made as follows (Ducci, 2015):

- information tools: they allow the dissemination of information and communications to the citizen and perform an information function, the dissemination of knowledge;
- relational tools: they allow the creation of a relationship and a bi-directional communication between the body and the citizen, making possible dialogue, listening to the user and participation.
- Transaction tools: allow an exchange between user and PA, enabling the delivery of the service and optimizing time, costs and resources.

Given the complexity of the organisation of the process of integrating the various channels and adapting the content, the PA are gradually approaching implementation starting, for example, from dual-channel combinations, within the framework of the trio "portal, call centre and one-stop-shop". The indication of the toll-free number on the website of the institution can be considered as a very first step of an embryonic multichannel (Wirtz and Langer, 2017).

The most innovative communication tools and channels within the PA are:

- Sites and portals: the portal is the evolution of a website, with respect to which it also offers interactive services. The portal is an organized system, an integrated interface for external and internal users, secure and personalized, able to offer information, news and services (Yuan et al., 2012; Andrýsková, 2003). A public portal is a "gateway" to administration services, open at any time and accessible from anywhere, where the user recognizes a unified point of contact. The importance of the public portal has grown with the spread of the Internet and the choice to make technological innovation the strategic lever of the transformation of the Public Administration, becoming a very important means of communication with users (Hub and Čapková, 2009). The Directive of the Department for Innovation and Technologies of July 2005, relating to the quality of online services and the measurement of user satisfaction, stresses the importance of the provision of online services and states that the sites and portals "are configured as virtual counters, ie point of reception and access for a catchment area potentially and hopefully much larger and more diverse than that of a traditional counter.

  The portal, from the point of view of multi-channel, is a virtual front office (Hřebíček and Bednář, 2002), i.e. a real office of the online institution that offers its users an access point to services and information. In the design of a public portal it is necessary to take some fundamental steps (Burke, 2016): define the objectives and aims of the site, identify the target that it aims to

achieve. The choice to build and implement a public portal should be linked to a strategic vision of the development of the administration and the development of the citizen-entity relations. The implementation of the portal should be a consequence of an adaptation of the internal organization and responding to the willingness / need to integrate physical and virtual delivery channels and increase administrative transparency.

The project phase and the strategic vision also include the choice of managing the portal on one's own, thus identifying the appropriate structures and personnel to create and manage the site, or through an external company (Mureşan, 2016). In the aforementioned directive of the then Department for Innovation and Technology, criteria are identified for the design and implementation of the portals, common to the different types, and indicate a series of characteristics such as to ensure the quality of services offered:

- compliance with accessibility rules and regulations;
- segmentation of services according to catchment areas;
- short, homogeneous and easily identifiable routes;
- presence of a clear and always updated map of the portal;
- availability of simple and effective search functions;
- organic and coherent aggregation of information and services, related by subject or purpose and with the possibility of direct access from one or the other;
- visible spaces and tools for direct contact (number, email address, etc.);
- use of multichannel, to fully exploit the potential offered by the integration between the telematic network and the traditional modes of service delivery.

These characteristics should be transferred in a coherent way in the design of the portal and in particular of its structure. The structure, the skeleton of the portal, should therefore contain some fundamental elements (Geraci et al., 2013):

- division into thematic areas, dedicated to specific users and topics, addresses, telephone and e-mail contacts to allow direct contact between citizens/entities;
- the administration's organisational chart, with offices, skills and related staff references;
- site map;
- simple and effective search engine;
- answers to frequently asked questions (FAQs);
- self-registration, to recognize individual users through username and password or digital certificate and to allow the customization of the portal and access to services;
- links of interest, sorted and functional;
- spaces for participation.

Finally, it is important to keep in mind that when transferring structures and services to computer support, the Public Administration must take the user and his needs as the central reference for both the design and delivery of the service (Gant and Gant, 2002). It is not possible, therefore, to take the traditional services and move them to telematic support.

A good public portal needs to be continuously updated. Creating a portal means starting a continuous review work to be developed on two fronts: technical and content (Yuan et al., 2012). The portal must be continuously adapted to the development of both the technological context and the communication techniques, declining in a positive and productive innovations, in line with the new needs of users. It is also necessary to adapt the public site to any new dynamics in the Public Administration (Andrýsková, 2003). As far as the content aspect is concerned, the work of revising and updating news and appointments should be done daily (Hub and Čapková, 2009). It is advisable to present good quality content and to add new topics of interest to users on a

regular basis. In order to promote the site and make the new content known, you can also use other tools such as the electronic newsletter (Hřebíček and Bednář, 2002).

For a conscious and user-oriented development of the portal it is important to monitor the portal, assessing both the amount of access to various content and services most used and the satisfaction of users. It is possible to provide the portal with useful tools for monitoring the site, such as a system for detecting static access, analysis of log files, to understand the paths and time spent on the various pages, and it is useful to develop customer satisfaction surveys to find satisfaction (Burke, 2016). In this way it will be possible to understand how to continue the editing work, which pages to remove or modify, which themes to develop, how to improve the delivery of online services (Mureşan, 2016; Geraci et al., 2013).

- Civic networks: "civic network" means a telematic information system, referring to a geographically delimited area (municipality, metropolitan area, province, mountain community, etc.), in which all the subjects present in the area can actively participate, i.e. as producers of information as well as users: local authorities and other institutions, trade unions, associations, businesses, citizens. In essence, it is a space where citizens can actively interact with administrators regarding public services (Freschi, 1998).
  According to ART.8 c) of Law 150/2000, the Office for Public Relations (URP) "shall promote the adoption of telematic interconnection systems and coordinate civic networks". To this end, it is necessary for the representatives of the citizens to be present in the network to participate in the debates, to respond to the problems and questions of those living in the administered territory. Having access to the right information is necessary to improve the decision-making process, study and deepen the problems, have tools already developed by others, acquire the right skills, design and implement ideas and

activities (Pilotti, 1996). A civic network should also include instruments to promote such forms of access. It is also useful to set up online consulting services that help to identify available resources, transmit the skills needed to draft a project to access public funding and follow the various stages of the process necessary for approval and delivery (Casapulla et al., 1998).

A civic network allows, therefore, to exercise the rights of citizenship proper to democratic institutions and at the same time to affirm new rights linked to the transformations of the "Information Society". Finally, a civic network is characterized with respect to other telematic initiatives and networked systems by the following elements (Freschi, 1998):

- transparency of administrative life;
- content provided by citizens;
- multichannel

- Social networks: social networks are groups of people connected to each other by any kind of bond (friendship, interests, work, passions, etc..) that relate by forming a community. Currently, the expression social network is most commonly used to indicate the tool used to create and maintain virtual networks and online communities (social netwok sites - SNS - or social networking site) (Nicolae, 2015).

  Public administrations, in a situation of continuous technological innovation and uncertain assessment of new means of communication, are confronting themselves with the possibility of using these new tools to communicate with citizens (Rolando, 2011). Within Public administrations, on the one hand, there are those who identify these means as an opportunity to communicate with targets of users often not reached by traditional means and a useful tool for informing and involving citizens, while, on the other, there are those who consider social networks as a superfluous tool, useless or even harmful, as they are considered to be able to cause waste of resources (Usual, 2014). In fact, however, social networks have also entered the Public Administration,

especially in the logic of multichannel. Many organizations, in fact, have activated their own profile on one or more social networks both to disseminate information about events and initiatives and to create new spaces for dialogue with citizens and new channels to collect their opinions and assess their satisfaction on services and institutional activities (Cioni and Marinelli, 2010).

Social networks, in their most innovative development, can potentially represent tools of e-democracy, virtual places of participation and expression of needs, opinions and interests (Cogo, 2012). The use of social networking sites can respond, therefore, to different needs and aims of Public administrations: increasing visibility, promoting the sharing of initiatives, increasing the authority of the institution, promoting events, informing about the services offered and how to use, etc..

For a useful and effective use of this tool, the design phase is fundamental: identifying the target, the goals you intend to achieve, the resources available and the content you want and disseminate, are the first steps to take for the activation of profiles on social networks sites (Sangiorgi, 2008): communication is effective if the message reaches the recipients. It is therefore essential to let the community know that the institution "has entered the social network".

As part of the activities aimed at developing the Guidelines for the websites of Public administrations, the Vademecum "Public Administration and Social Media" has been drawn up, the aim of which is to investigate the ways in which social media can be used by the PA to improve communication and direct contact with citizens.

- Instant messaging: Instant messaging refers to forms of simultaneous online communication between two or more users, such as chats. Instant messaging allows two or more distant subjects to communicate and converse in real time, sending short text messages.

  The main characteristics of instant messaging communication are (Carey and Robinson, 2004): synchrony (i.e. communication takes place in the co-

presence of the interlocutors), informality (the tone mainly used in conversations is informal), the simplicity of the language and the content of the conversation (the tool is difficult to deal with complex topics) and, above all, the brevity of the messages. In order to respect the rapidity of the conversation, in addition to writing synthetic messages, the interlocutors often use symbols and small images (such as emoticons) that allow to reduce the writing time to a minimum, also performing an emotional function, that is, offering elements of expression of the (virtual) moods of the interlocutors.
Instant messaging (like most of the telematic services offered by the Internet) is based on a mode of client-server interaction: the server performs the necessary operations to make the service work, the client program, on which the user acts, is an operating software that enables the user to forward requests to the server that processes them and sends them back to the user (Guelfi et al., 2011).

To communicate through instant messaging, therefore, you must install the messaging software (generally the programs with basic functionality are available free of charge) and have an internet connection.

Some types of instant messaging, such as chats, are also available on other tools: some e-mail programs, for example, offer the ability to communicate instantly with contacts registered in the address book; social networks that, among other features, include chat communication with the contact network or VoIP programs that, in addition to telephone communication, allow the exchange of short text messages between interlocutors. Today, in addition to offering instant messaging, these programs allow you to communicate simultaneously in audio or video mode, to exchange files, to send e-mail messages.

In the Public Administration, instant messaging begins to spread in the logic of multichannel, as a support tool for communicating and dialoguing with citizens (Kumar and Sinha, 2007). Instant messaging can also be used as a means of "internal communication", allowing employees of a public body, including those located in different locations, to communicate, collaborate remotely, exchange links, files and materials in various formats, quickly and economically, allowing a reduction in costs for the administration (Casalino et al., 2007).

- Forums and newsgroups: Forums (or message boards, or conferences, or bulletin boards) are virtual meeting places where a number of people meet to discuss issues of common interest. It is one or more web pages where you can send a message that all other users will read and possibly comment, giving rise to discussions of all kinds and lengths on the most diverse topics (Liu and Yuan, 2015). As in the case of mailing lists, we are faced with an asynchronous communication mode, in the sense that people are not obliged to find themselves simultaneously in the same place (virtual or not) to be able to communicate, a condition that is indispensable in the case, for example, of chats.

  Unlike mailing lists, forums can be integrated directly into a website. This feature contributes significantly to creating, among people geographically distant, the feeling of belonging typical of each community. Moreover, the forums immediately provide the context for each discussion, facilitating the inclusion of newcomers, who can quickly become aware of both the subject under discussion and the views expressed on it (Špaček and Špalek, 2007). Within the main theme there are always specific sub-themes, individual issues around which all subscribers can confront and discuss. This allows even very large communities to fractionate naturally, making it easier to manage the entire community (Canel and Luoma-aho, 2018).

In the case of an important topic, in a mailing list there is a serious risk that the mail box will tilt in a very short time - a risk that in the case of forums does not exist. Inserting images directly into text or at least activating links to add them is an option that almost all bulletin board packages now allow you to configure. Again, it is about helping members feel more directly and personally involved, giving them the opportunity to express themselves and discuss more easily. In general, online forum management software or services allow you to store all posted messages, while others delete messages that are older than a certain date. Keeping the texts in the archive is in fact one of the most useful functions since it allows to keep constantly present the whole history of the community, to study the interests of the participants and their evolution in time (Ducci, 2017). The reading of the messages contained in the Forums is free, so everyone can browse them. To read a message, you usually click on the title. The "Read Message" page allows you to view the text of the desired message.

To insert a message or open a new discussion, instead, you must be a registered user of the portal of the Public Administration. Generally, PA forums are "moderate", in the sense that messages sent before being published are read and authorized by the moderator (subject in charge of the Public Administration), who is the person in charge of monitoring the discussions on the Forum (Miani, 2005). One of the moderator's prerogatives is to block a user who is disturbing the forum. In the field of digital Public Administration, there are also reserved forums, i.e. special invitation-only forums in which only certain categories of persons with specific requirements (e.g. pensioners) can participate (Lovari and Masini, 2008).

- T-Government - Digital Terrestrial Television: unlike the "traditional" analogue television, digital terrestrial TV - known as T-DVB (Terrestrial Digital Video Broadcasting) - uses digital signals such as those of computers,

the Internet and mobile telephony for the transmission of content and television channels (Sipior et al., 2011). In Italy, this technology has been spreading rapidly but gradually for about a decade. There was, that is, a "switch-over" situation, a period during which digital television broadcasts lived with analogue ones.

The advantages offered by digital technology compared to analogue technology can be summarised in the following aspects: a greater number of programmes and channels available, better image/audio quality, interactivity and the possibility of active and immediate participation in television programmes (expression of preferences, selection of products, etc.) through the remote control, lower electromagnetic pollution (requires lower transmission powers compared to analogue technology). Digital television allows the use of traditional television, the mass media still more used today, as a new communication tool, an information channel and at the same time interactive, which allows to offer content and services of public utility to citizens and businesses (Weerakkody and Dhillon, 2008). The use of digital terrestrial technology in Public administrations is called T-Government. The decision to develop T-Gov services for public bodies is part of the logic and strategy of multichannel (Irani et al., 2007).

Digital terrestrial television allows you to "navigate" through information portals and access personalized information, using the simple remote control, the smart card and the "return channel", ie the connection of the decoder to the telephone line. Through this technology, the user/citizen can access an offer of specific information on their territory and on the services of local authorities, and above all benefit directly from certain services, such as requests for certificates, participation in calls for tenders, payment of taxes, booking of health services, etc., without having to go to the administrative counters. This possibility represents the most important potential of the instrument, which also marks the difference and evolution compared to teletext.

To take advantage of the interactive institutional services offered by the Public Administration, the citizen must have an interactive decoder, as described above, so that it is possible, through the smart card issued by the institution, the identification of the user (Weerakkody et al., 2007). Standardised tools used by the Public Administration to guarantee secure and easy access by citizens to the services of T-Gov, for example the National Service Charter and the Electronic Identity Card (Cornacchia et al., 2008).

A positive aspect and a reason for the choice of this means for administrations is the possibility of reducing the digital divide, which the spread of new technologies may have created in the field of public services, especially for a certain group of users (Van Veenstra and Janssen, 2012). Even today, in fact, television is the most widely used media and capable of reaching all social groups of the population. Public administrations, using digital terrestrial technology, can, in fact, offer users not used to using the telematic channel but much more practical in using the television, an alternative tool that allows you to take advantage of services and information 24 hours a day directly from home, or at least without having to go to the offices at scheduled times (Pagani, 2010).

As for the telematic channel, the administration can, in order to reduce the digital divide and simplify the provision and use of services, provide for the installation of public access points and free of charge to this technology, as is the case for internet stations: screens can be placed on public transport for example to disseminate information of public utility or in stations or other appropriate places to allow access to certain services (Niehaves and Plattfaut, 2010).

T-Gov is a way to access the online services and services of the Public Administration, from the home television with simpler and more standardized

modes of use (Jaklic and Štemberger, 2009). T- government and E-government, therefore, are parallel tracks and in some converging points of the same path (Singh and Hackney, 2011), oriented towards multichannel, simplification and cost reduction, the widening of citizen participation, more widespread transparency, better governance of the territory (Dais et al., 2013).

- Web TV and web radio: when we talk about Web TV we mean a normal Internet site that, in addition to offering content composed of text and images, allows connected users to play content in audio video format that automatically adapt to the reception capacity of each user connected (Liu and Yuan, 2015).

  Of course, the higher the available bandwidth, the better the quality of reception, while there can be considerable degradation for low quality connections. With Web TV it is therefore possible to build a real television accessible via the Internet by simply using the computer and where the viewer becomes a user (Špaček and Špalek, 2007). Web TV can broadcast both live and on-demand, allowing both the viewing of content on the program (schedule) and the ability to create a personalized schedule with free choice of content on demand. Web TV allows two-way dialogue with the citizen through the ability to provide feedback, activate forums, newsletters, online chat, community and represents a great opportunity for communication for all areas related to the promotion of the territory (Canel and Luoma-aho, 2018). It has no geographical borders of diffusion, favouring the internationalisation of communication and offering virtually unlimited audiences and targets of spectators.

  Web TV reduces production and transmission costs thanks to innovative technologies and to the zero cost of the basic infrastructure thanks to "streaming", meaning the flow of audio/video data transmitted from a source to one or more destinations via a telematic network (Ducci, 2017). The user who wants to watch a content through the Web TV simply connects to the

delivery platform. To have a good view it is preferable to have an ADSL broadband connection or better with fiber optic cable where you use "compression" systems that aim to reduce the number of data needed to view movies (Miani, 2005).

In Italy, with Law no. 150 of 7 June 2000 "Rules for information and communication activities of Public administrations", the legislator provided that audiovisual and telematic systems in Public administrations should be placed on the same level as the traditional press and, as a result, has encouraged the use of information technology to ensure the dissemination of useful messages to the citizen-user.

In fact, Art. 2 states that: "Information and communication activities are carried out with every suitable means of transmission to ensure the necessary dissemination of messages, including through graphic-publishing equipment, computer structures, counter functions, civic networks, integrated communication initiatives and multimedia telematic systems.

Today, more and more public institutions are using this tool to communicate their institutional activities to citizens, create newsletters, promote the territory, sponsor events, etc. in a direct, modern and interactive way, which is an essential element to promote the development of E-democracy (Lovari and Masini, 2008). An example of this kind is given by the Chamber of Deputies and the Senate of the Republic where they have made available a service of live transmission of all parliamentary work, accompanied by the service of being able to view on request all the sessions in the archive. The system has made it possible to democratise the accesses that were previously exclusive to journalists accredited as Parliamentary Press.

- M-Government - Third generation mobile technology: The smartphone, being the most widespread communication tool in industrialized countries (Kumar and Sinha, 2007; Nica and Potcovaru, 2015; Misuraca, 2013), is potentially

the ideal technology to bring citizens closer to Public administrations (Kushchu and Kuscu, 2003; Sharma and Gupta, 2004). To confirm the potential of the vehicle, in the vast majority of experiences of multi-channel contact with users developed by the PA, the smartphone is always included among the various tools used (Trimi and Sheng, 2008). The use of mobile telephony by Public administrations in the provision of services and in their relations with citizens is defined, in affinity with e-gov, as M- government (Mengistu et al., 2009; Sheng and Trimi, 2008; Sandyand and McMillan, 2005). Public administrations can provide different types of services at different levels via mobile phones (Ishmatova and Obi, 2009; Antovski and Gusev, 2005):

- information services: in addition to the more traditional satisfaction of requests made by telephone, institutions can provide for the sending of text messages to citizens or the possibility of requesting information via text message;
- participatory services: smartphones can be used to promote active participation, for example by disseminating citizen satisfaction surveys or SMS surveys;
- transactional ticketing and booking services: Public administrations, like some private companies, may provide the possibility to pay for certain services via mobile phone or to book certain services.

2.2 Dissemination of the Open Government Data

2.2.1 Open Data in the Public Administration

Information, understood as a vision of the reality deriving from the processing and interpretation of data, can be considered as the "lifeblood" of democracy, capable of supporting the development and stimulating the growth of a country (Office of

the Australian Information Commissioner, 2013). This belief has changed the way governments have begun to evaluate, manage, use and share their data and related information both within and outside their borders, in an attempt to facilitate the overall improvement of policies, existing structures and working practices in the public sector (Ubaldi, 2013). With reference to this consideration, a useful and important instrument of transparency in the PA is represented by the so-called "open data", which allow democratic control, contribute to the improvement of the quality of life of citizens and allow to give impetus and support to economic growth, in view of the value of the public information heritage and the possibility of re-use of data for new products and services (Rizzo et al., 2009; Janssen et al., 2012).

The Open Knowledge Foundation (https://okfn.)org/) identifies some key aspects of open data, first of all highlighting that data must be available in a complete, up-to-date and easily accessible manner (preferably via the Internet); moreover, in order for data to be truly 'open', it must be provided under conditions and in formats that allow it to be reused, redistributed and recombined (known as 'interoperability') with other data (Lakomaa and Kallberg, 2013); Finally, everyone must be able to use, re-use and redistribute data in accordance with so-called "universal participation", without discrimination of any kind, either on the basis of scope of initiative or against individuals or groups (Höchtl and Reichstädter, 2011).

Open data are a further step towards modernising PA to ensure transparency, participation and collaboration among citizens (Huijboom and Van den Broek, 2011).

The term "Open Data" means public data in an open, "free" format that is accessible to all citizens, as well as being easily reusable and exchangeable on the web, without restrictions on copyright, patents or other rights (Gurstein, 2011).

Making data concerning the community accessible and usable, so that everyone can take advantage of it, is not an innovation intended only for a few specialists, but involves everyone, since it allows to obtain information, which in fact already belong to the users, but in a transparent and direct way, making citizens more informed and aware (Zuiderwijk and Janssen, 2014). There is no doubt, in fact, that having data on the budget reporting of their municipality or data on traffic, environment, etc. can be a heritage that every citizen has the right to know (Chan, 2013).

Under the stimulus of the international context, the Italian regulatory evolution has paid attention to the transparency of Public administrations, to its dynamic and active aspect and, therefore, to open data (Davies, 2010; Clarke and Margetts, 2014; Domingo et al., 2013). In fact, after the experience of the British government with www.data.gov.uk and the U.S. government with www.data.gov, the theme of "Open Data" has arrived in Italy and is becoming increasingly important because it is included among the elements of innovation of the NEW CAD, recently updated. In the Italian panorama is active the Portal of open data of the PA www.dati.gov.it, created to promote the reuse of public information for citizens, developers, businesses, trade associations and Public administrations themselves. Dati.gov.it is inspired by the European strategy for Open Data within the Digital Agenda for Europe.

The text of the NEW CAD, Legislative Decree no. 235/2010, deals with the theme of open data and provides, among other things, that the responsibility for updating, disseminating and enabling the exploitation of public data lies with the Administrations. In particular, the PA, in order to enhance and make available the public data they hold, is required to promote projects of processing and dissemination, ensuring free access and publication in open format for subsequent processing.

Open data are the engine for innovation, growth and governance also in Europe. Recently, the European Commission, as part of the actions of the European Digital Agenda, presented a programme of actions for the re-use of public sector information that should make a substantial contribution to the European economy. These actions place the European Union at the global forefront in the re-use of public sector information and will boost the already fast-growing sector of transforming raw data into material on which hundreds of users of information and communication technologies depend.

The strategy for achieving this at pan-European level follows three lines: adapting the regulatory framework through the revision of the Directive on the re-use of public sector information; mobilising financial instruments to support "open data" and taking action to create European data portals; and facilitating coordination and sharing of Member States' experiences.

Also in the last PA Forum we talked about Open data and, during the conference on this topic, organized by the 'Italian Association for Open Government, an association created to raise awareness among citizens and Public administrations to promote the implementation of strategies of Open Government, was presented the second version of the Guide: "How do you do Open data? Instructions for use for Public Bodies and Administrations".

Open data represent, in fact, a precious resource for citizens and businesses (Rizzo et al., 2009), but the value of free data does not depend only on the information they transmit to us, but also on a series of requirements in which this information is transmitted (Janssen et al., 2012). The value of the data, grows in the measure in which the user can exploit them: combining them, mixing them to build new applications of social, economic value, etc..

The following requirements must be met in order to be able to speak open data (Lakomaa and Kallberg, 2013; Höchtl and Reichstädter, 2011; Huijboom and Van den Broek, 2011):

- complete data, available to the citizen without restrictions from the point of view of copyright, patent etc.
- primary data: must be collected at source, in non-aggregated and non-modified forms;
- data available on the network in a timely manner to preserve its value;
- data available in digital format;
- data that can be used from a technical point of view;
- data that can be read on the computer by anyone and not bound by a particular software;
- complete data, i.e. capable of being aggregated or, conversely, disaggregated;
- reusable and redistributable data for any use;
- constantly updated data.

As part of the Guidelines for Public Administration Websites, the Vademecum on Open Data "How to make Public Administration data open" has been produced for administrators, managers and public employees, as well as for suppliers and consultants of Public administrations who want or need to deepen the topic of open data and start a process of opening up public sector data. The document is in turn structured in two main parts:

- Part I - PA and open data: introduces the concept of Open Government, the practice of Open Data and presents an in-depth regulatory framework on the two issues. This first part is divided into the following four chapters: 1) Open Government; 2) Open Data; 3) Regulatory Framework; 4) How to start the process of opening data.

- Part II - How to open the PA data: contains a description of the technical, organisational and legal aspects to be addressed before making the Administration data available. The second part consists of the following five chapters: 5) Organisation for the opening of the data; 6) Identification of the data; 7) Analysis of the datasets; 8) Publication of the Dataset; 9) Dissemination of the Dataset.

2.2.2 Origin and evolution of the OGD

Originally established in English-speaking countries (primarily the United States of America and soon after the United Kingdom, Australia and Canada) (Gonzalez-Zapata and Heeks, 2015; Dawes et al., 2016; Geiger and Von Lucke, 2012; Jetzek et al., 2013), the OGD has more recently established itself in Europe as a model of management and leadership of the Public Administration (Hoxha and Brahaj, 2011; Solar et al, 2012; Vetrò et al., 2016), mainly as a result of the strong drive exerted by major international organizations, including the World Bank and the Organization for Economic Cooperation and Development (OECD).

Although the dictates of the OGD had involved the public policies of the institutions of various countries of the world for some time now (Attard et al., 2015), the first real impulse to its affirmation came from the branch of the Directive on Open Government by the then President of the United States of America Barack Obama in December 2009 (Sayogo et al, 2014; Kučera et al., 2013; Schrock, 2016; Zeleti et al., 2016), which reads: "Where possible and subject to only valid restrictions, agencies should publish information online in an open format that can be retrieved, downloaded, indexed and searched through the most commonly used web applications. Open format means a format independent of the platform, readable by the computer and made available to the public without preventing the reuse of the information conveyed.

Prior to its effective release, civil society has for many years been lobbying government authorities to make government data available in machine-readable formats (Janssen, 2012; Albano, 2013; Magalhaes et al., 2014), with initiatives such as "TheyWorkForYou" in the UK and "GovTrackUs" in the US (Hogge, 2010).

However, the clear sign of the implementation of the content of the Directive is represented by the structuring of the portal https://www.data.gov/, which contains all the information made available by U.S. public bodies in an open format to make it available to U.S. citizens and businesses, in order to ensure transparency, participation and cooperation of all those who, directly or indirectly, are or could be interested in obtaining, verifying and sharing information about the public life of the country (Davies and Bawa, 2012).

As reported on the portal http://open.gov.it/, since September 2011, Italy has joined the Open Government Partnership (OGP) through a series of international projects, such as "OpenCoesione" and "SoldiPubblici". In 2016, then, the Italian government, through the Department of Public Administration, started an organic action to promote the dissemination of the principles of the OGD through a series of actions, some of which have received international approval becoming practice in many other countries, both EU and non-EU. Among the main interventions implemented by Italy to promote the OGD are (Chan, 2013; Kalampokis et al., 2011; Yannoukakou and Araka, 2014; Yang and Shiang, 2015; Coglianese, 2009):

- the implementation of strategies for comparison with the public bodies involved for the concrete implementation of the measures implemented;
- monitoring and verifying the achievement of commitments made to citizens in terms of transparency, collaboration and participation;
- the establishment of an institutional working group made up of representatives of central, regional and local administrations;

– the creation of the "Open Government Forum", a multi-stakeholder forum for discussion with civil society organisations.

2.2.3 The principles of the OGD: Transparency, Collaboration and Participation

In the light of what has been described above, it is easy to understand that the affirmation and consequent diffusion of the Open Government Data (OGD) as an approach to the management of data in the context of the management and management policies of Public administrations is configured as a long and articulated process (Shadbolt et al., 2012). In fact, over the years, the need to process data relating to the services provided and used by the Public Administration has gradually emerged by virtue of the increasing awareness of bodies, private companies and citizens about the benefits arising (Janssen, 2011).

Over the years, the concept of OGD has undergone exegetical changes, mostly considered as additions to the original concept, determined by the change in political, economic and social conditions that have characterized and conditioned the Public Administration in the last twenty years (Bates, 2014).

In some respects, the OGD can be considered the logical evolution of e-Government (Jetzek et al., 2014), i.e. the process begun in the late 1990s that saw the Public Administration equip itself for the first time in a systematic and structured way with information and communication technologies (ICT). The evolution of the organizational and doctrinal paradigms that have been typical of e-Government has necessarily had to deal with a constant evolution of technologies and, in particular, of the Internet (Böhm et al., 2012).

To date, we speak of "Open Government Data" to define a mode of management and management of public bodies at all levels, which involves the use of

strategies, techniques, tools and technologies to make the Public Administration "open and "transparent" to citizens, in order to ensure greater cost-effectiveness of policies and government actions (both central and local) (Geiger and von Lucke, 2011).

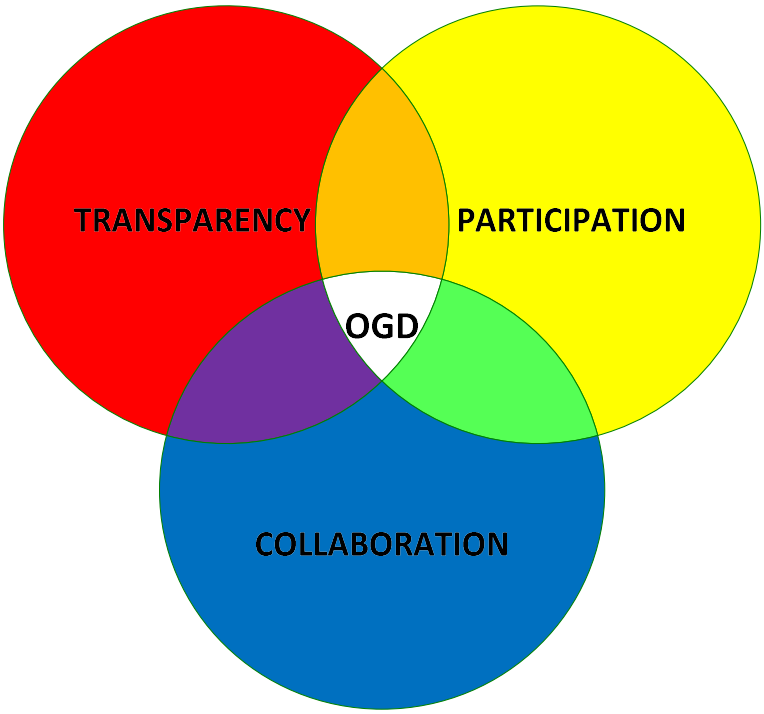
It is, therefore, a new model, a new way of thinking, which, among other things, induces public bodies and institutions to rethink the logic of communication, involvement and participation of citizens and companies receiving the services provided, facilitate innovative forms of discussion and collaboration, characterized by considerable openness and high transparency towards the community. In this regard, Gigler et al. (2011) define the OGD as a necessary approach to promote the accountability of the Public Administration.

However, although the principles of the OGD (Transparency, Collaboration and Participation) are common to all interpretations, each country follows the approach by focusing its efforts on specific goals. In this respect, Huijboom and Van den Broek (2011) argue that, for example, the US OGD is primarily aimed at ensuring transparency of public action and democratic control, the Danish OGD is more innovation and growth oriented, the UK OGD is more efficient in its administrative policies, and so on.

In any case, the diffusion of the OGD is justified by the attempt to place the citizen at the centre of the actions carried out, stimulating dialogue and direct and participatory dialogue with public bodies (Wang and Lo, 2016), benefiting from greater adherence of policies and public choices to their real needs.

All this has been made possible not only by a greater awareness of the importance of taking an active part in the process of delivering / using the public service, but also and especially by the spread of increasingly advanced and customizable technologies (Parycek et al., 2014).

Figure 2: The principles of the OGD



Source: *Adapted from Lathrop et al. (2010)*

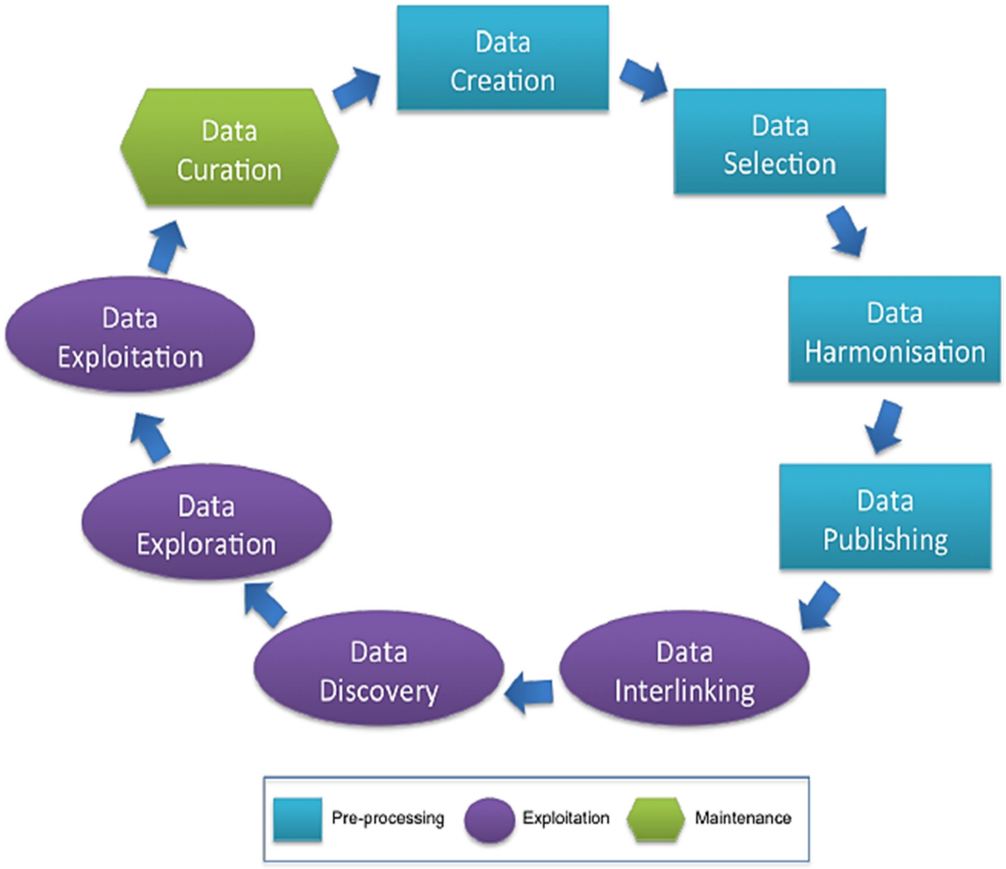
Naturally, the acceptance of such an approach has not been easy and, to tell the truth, resistances still exist and are evident that prevent or, in any case, complicate the enjoyment of the benefits arising from overcoming the traditional bureaucratic schemes, based on principles that recall rigidity rather than bi-directionality, sharing and participation of citizens through the new digital tools (Kucera and Chlapek, 2014). Moreover, in accordance with the principle of transparency, public authorities are required to enable and facilitate citizens to monitor their actions at different levels of government through ubiquitous and scalable technologies. Transparency of administrative action, therefore, presupposes that citizens can freely access, verify and share data from public bodies (Jetzek et al., 2012).

The importance of the role that new technologies and, in particular, ICTs play in fostering openness, transparency, collaboration and participation, to the point of being conserrated as the main enabling factor of the OGD (Shadbolt et al, 2012; Janssen, 2011), an approach that, while on the one hand incorporates some principles and customs in part already consolidated in the PA, on the other hand emphasizes them according to a meaning in step with the times, especially in view of the recognition of the role of citizens (Bates, 2014; Jetzek et al, 2014; Böhm et al., 2012), no longer seen as mere passive recipients of the process of delivering public services, but rather as proactive actors, able to contribute synergistically to increasing the effectiveness and efficiency of public action (Geiger and von Lucke, 2011; Wang and Lo, 2016).

Transparency, Collaboration and Participation are guaranteed principles throughout the life cycle of the OGD, of which Attard et al. (2015) propose a graphic scheme structured in nine complementary and propaedeutic phases, divided in turn into three related sections: data pre-processing (blue rectangle); data exploitation (purple oval); and data maintenance (green hexagon).

- Phase 1 - Data creation: this may be voluntary (when data is specifically sought to achieve a specific purpose) or unintentional (when data is derived from the performance of the activities of the public body;
- Step 2 - Data Selection: In this step, personal or sensitive data is removed for reasons of privacy protection. Anonymous data is retained for further processing;
- Step 3 - Data harmonisation: this step involves preparing the data to be published according to certain standards previously defined by the administration;
- Phase 4 - Data publishing: in this phase, the actual publication of the previously revised data takes place on government portals.

Figure 3: Open Government Data Life Cycle



Source: *Attard et al. (2015)*

- Phase 5 - Data interlinking - allows the creation of internal and external links between the data, promoting a better understanding and easier interpretation of the information transmitted
- Step 6 - Data Discovery: Since publishing data alone is not sufficient in itself to allow data to be re-used, citizens should be made aware that data exists, where it has been published and how it can be viewed and downloaded.

- Step 7 - Data Exploration: This step is the easiest way to use the data. Here, a user passively examines open data by viewing or scrutinizing it.
- Step 8 - Data Exploitation: Enables citizen-consumers to proactively use, re-use and/or distribute data, e.g. by conducting analysis, creating mashups, etc.
- Step 9 - Data curation - is essential to ensure that published data is sustainable. This involves the completion of a number of procedures, including the updating of outdated data, the enrichment of data and metadata, the cleaning of data, etc.

Chapter III

Structural Equation Modeling

3.1 Methodology of social research; **3.2** Quantitative research: opportunities and threats; **3.3** Structural Equation Models; **3.3.1** Reliability, internal consistency and validity of the measurement scales; **3.3.2** The measurement model; **3.3.3** The structural model; **3.3.4** Specification and estimation models; **3.3.5** Convergent validity and discriminating validity of latent variables.

3.1 Methodology of social research

The aspects inherent in the research methodology concern the choice of ways in which to know, investigate, analyze and represent reality. This choice can take on different connotations depending on how the researcher considers the reality being analysed: as an external entity or as something with which to interact. Depending on the premises defined by the researcher, therefore, two different types of research can be outlined, whose peculiarities are summarized in the table 6.

The table allows a first comparison to be made between the two different types of methodological approach, highlighting how each of them has its own specificities that can respond to the needs generated by the different purposes that the researcher gradually sets himself/herself.

Table 6: Main differences between quantitative and qualitative research

Distinctive features	**Quantitative research**	**Qualitative research**
Theoretical Setting		
Modes of representation of Theory	Structured, logically sequential, deductive and in the context of justification phases	Both theoretical elaboration and empirical research proceed intertwined
Theoretical concepts	Concepts are found to be antecedent to research	Orientatives
Type of relationship with the environment	Neutral, no contact with the object of study	Naturalistic, presence of physical contact with the object of study - empathic identification
Role of the subject studied	Liabilities	Active
Detection		
Research design	Structured and closed	Modelled as the survey progresses

Representation	Statistically representative sample	Individual cases not statistically representative
Detection instrument	Uniform for the entire sample	Variable from individual to individual
Nature of the data	Objectives and standardized	Subjective
<u>Data analysis</u>		
Methods of data submission	Tables	Narrative
Generalisations	Causal relationships between variables to explain the results obtained	Identification of ideal types of conceptual categories that can be used as models to interpret reality
Scope of results	General data	Specific data

Source: *Adaptation from Macrì and Tagliaventi (2000) and Corbetta (2003)*

In the following paragraphs, considering the objectives of the work, already stated in the previous pages, the focus will be on quantitative research.

3.2 Quantitative research: opportunities and threats

Quantitative research in the social sciences is structured in logically sequential phases. We start from the analysis of the literature in order to examine the existing contributions and decide whether to falsify the theory or parts of it or, if proposing a new theoretical hypothesis, subjecting it to empirical analysis (Macri and Tagliaventi, 2000).

Once the research hypotheses have been defined, the constituent elements are then operationalised. In other words, the latter are transformed into empirically observable variables.

Once the empirically observable variables have been obtained, both the sample under analysis and the criteria for its selection are defined.

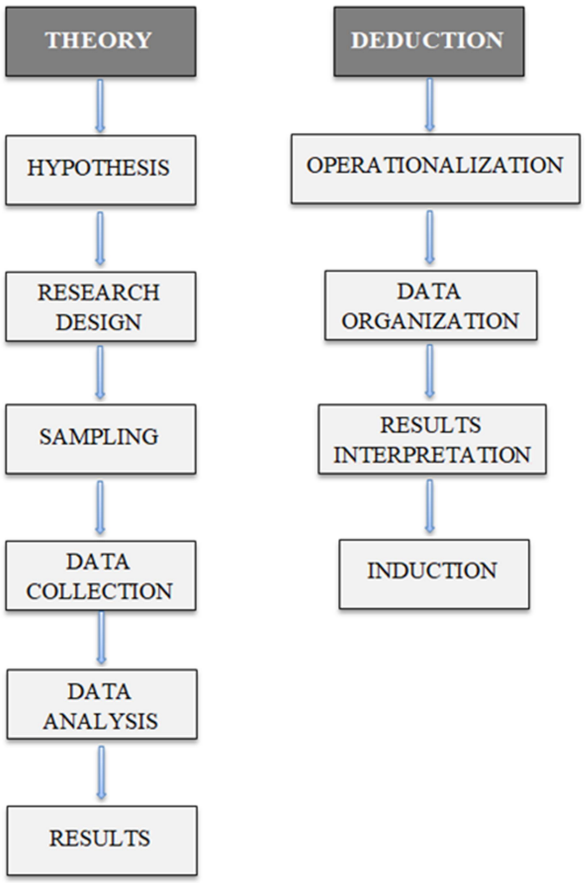
The sample must make it possible to generalise the results collected to the wider universe of which it is part. In other words, it must be a statistically representative sample and, therefore, able to represent significantly the largest set that you intend to study.

Macri and Tagliaventi (2000) point out that the data collected are subjected to very often complex analyses, with the aim of establishing relations between dependent and independent variables, through recurrent schemes. From this it is possible to identify as the foundation of the quantitative research the so-called logic of causality, which allows to identify all the possible links of cause and effect between the variables under study.

Quantitative research techniques allow the researcher to start from the theory and return, always and in any case, to it, thanks to an induction process that, starting from the empirical results obtained, compares itself with the original theory, ultimately succeeding in confirming or reformulating it.

The process described can be depicted as follows:

Figure 4: Diagram of the quantitative research process



Source: *Adaptation from Bell and Bryman (2007)*

Among the different techniques of quantitative analysis existing in the literature, a significant diffusion in different fields of social and behavioural sciences (Hershberger, 2003; Nelson et al., 2008; Sanchez et al., 2005; Shah and Goldstein, 2006; Tomarken and Waller, 2005; Williams et al., 2009) concerned the Models

of Structural Equations (SEM), which have assumed a significant role in the identification of simultaneous causal links between a plurality of variables, even latent ones. In this regard, in order to better respond to the cognitive objectives of this work, it was decided to adopt an approach based on the use of these models that allows to test empirically and, above all, simultaneously the relationships existing between the variables making up the proposed model.

3.3 Structural Equation Models

The adoption of SEMs implies the implementation of a series of phases to be carried out in a sequential manner (Byrne, 2016, 2013; O'Rourke et al., 2013):

- model specification;
- parameter estimation;
- evaluation of the model and parameters;
- modification of the model.

In essence, it is a sequence of phases that can be repeated several times until a model that is acceptable can be found.

The objective of the SEM, as a technique of multivariate statistical analysis, is to allow the verification of hypotheses regarding the influence of a set of variables on others.

In other words, they are aimed at studying the linear relationships between one or more independent variables and one or more dependent variables, which can be objectively observable or not directly observable and, as such, latent; in this case, they are variables that are measured indirectly, by means of one, two or more detectable indicators (defined as "items".

Causal analysis is useful to identify, empirically verify and measure the intensity of the relationships by which one or more action variables, called $_{Xi}$, produce a response variable (Y), thus generating relationships of cause and effect (Kline, 2015; Byrne, 2013; Lomax and Schumacker, 2004).

In order to identify the existence of a causal relationship, four conditions must be met, which Bagozzi (1990), Asher (1983) and Bollen (1989) classify as follows:

1) Contiguity in time and space of cause and effect;
2) Time priority of the cause over the effect, so that the former can determine the direction of the relationship;
3) Covariation and constancy between cause and effect (repeatability of the relationship);
4) Elimination of other causes that determine the relationship of cause and effect.

In addition to the existence of such conditions, the empirical verification in a perspective of "confirmation" or "falsification" of causal relationships requires, as already mentioned:

- The identification of one or more independent variables, which are assumed to be determinants of the dependent variable, and the specification of the mechanism by which these variables act on the latter;
- The definition of the type of causal relationship, considering the multiplicity and different nature of the independent variables (e.g.: identification of the variables that play a role of moderation or mediation);
- Verification of the direction of the report;
- The measurement of the impact of the cause on the effect (application of appropriate statistical techniques).

Precisely because of this specificity, the Models of Structural Equations not only represent a suitable methodology for analysing models, both simple and difficult

to deal with, but also allow for a series of advantages that can be expressed in the possibility of carrying out operations that would otherwise not be possible (Schumacker, 2017; Keith, 2014; Byrne, 2013).

In fact, the variables of theoretical interest in the social sciences are often latent, i.e. abstract concepts not directly observable, whose measurement, as already mentioned, can only take place indirectly, through observable variables affected by measurement errors, which represent empirical indicators imperfect, i.e. measures consisting of scores observed and subject to errors in observations.

These considerations show how the structure of theory in the social sciences presents itself as a set of elements that include theoretical concepts, measures and hypotheses on the relationships between concepts and between concepts and measures (Sarstedt et al., 2017; Grimm et al., 2016; Newsom, 2015).

Edwards and Bagozzi (2000) define a construct as a conceptual term capable of describing a phenomenon of theoretical interest, the key elements of which can be grouped as follows:

- constructs refer to phenomena that are real and exist independently of the awareness and interpretation of the researcher and the subjects being studied;
- constructs are abstract conceptual terms that can give a name (verbal surrogates) to phenomena;
- the phenomenon described by the construct can be either unobservable (e.g. subjective states described as attitudes) or observable (e.g. behaviours described as task performance);
- constructs may differ in the way in which they describe and give meaning to phenomena of theoretical interest; some of them may show lasting usefulness, others may be modified or abandoned.

Otherwise, a measure is an observed score, or numerical data collected through questionnaires, interviews, observations or other tools, that is considered as the empirical analogy of a construct (De Vellis & Dancer, 1991; Edwards & Bagozzi, 2000).

More specifically, it does not refer to the data collection tool or collection action, nor to the score generated by these procedures.

With regard to measurement errors, however, it is possible to distinguish the error in the equation from the measurement error. The first one has the function of explaining the part of the variance of the dependent variable that is not explained by the independent variables and depends on explanatory variables not taken into account or on errors in the explanation of the functional form. The second explains the part of the measure variance that is not explained by the underlying latent variable and depends on problems related to the measuring instrument, the respondent's personality (social desirability) and lack of accuracy in responses.

3.3.1 Reliability, internal consistency and validity of the measurement scales

In the light of the above considerations, especially regarding the existence of causal relationships, both between theoretical constructs (causal models) and between constructs and their respective measurements (measurement models), the definition of scales implies the consideration of certain aspects that are particularly relevant (Stein et al., 2017; Hwang and Takane, 2014).

First of all, the internal reliability and coherence of the variables observed must be verified and it must be possible to prove that they are capable of measuring the same construct. Secondly, the verification must concern the validity of the

measures, i.e. their ability to express the construct with stability by means of repeated measurements over time (reliability/stability) and to be able to effectively measure what is to be measured (validity).

Once all these aspects have been considered, it is possible to proceed with the development of Models of Structural Equations, the main aims of which are listed below (Henseler et al., 2015; Bollen and Long, 1992):

- Quantify and test complicated theoretical models;
- Include both observed and latent variables;
- Consider dependent variables within the same model also as predictors;
- Take the measurement error explicitly into account.

The SEMs, in fact, are a methodology of analysis that provides for the specification, estimation and testing of two sub-models:

- The measurement model, which specifies the relationships between latent variables and observed variables by means of a confirmatory factorial analysis, determining the reliability and validity of the measurement;
- The structural model, which specifies the causal relationships between the latent variables, determining the causal effects and the amount of variance explained.

All this explains why SEMs allow, on the one hand, to analyze the structure of causal relationships (direct and indirect) between a set of latent variables, each of which is measured with one or more indicators that are assumed to be affected by measurement errors and, on the other hand, to estimate the aforementioned error in the equation that can indicate that the latent variables assumed as dependent are not perfectly explained by the latent variables assumed as independent (Wisner, 2003; Cadell et al., 2003).

In order to be able to describe the latent variables, representative of a phenomenon of theoretical interest not directly observable, reflexive indicators are generally

used which, as a whole, constitute a scale of measurement (De Vellis and Dancer, 1991). Latent variables, in fact, represent the latent part common to a series of observable variables (items). From an algebraic point of view, the latent variable causes the observable variables, which are presumed to be significantly related to each other. However, unlike the form of latent variables, which are measured by reflective indicators, some constructs can be represented by linear combinations of indicators. In this case, we speak of training indicators and measurement index (Edwards and Bagozzi, 2000) and the causal relationship is inverse with respect to the hypothesis of latent constructs, as it is the training indicators that are the cause of the aggregate construct.

A typical example of an aggregate construct is the socio-economic status, which is made up of a combination of four training indicators: education, income, employment and residence.

The main differences between the reflective and training indicators are shown in table 7:

Table 7: The main differences between reflective and educational indicators

Latent measurement models with reflective measurements	**Aggregate measurement models with training measures**
– The direction of causality is from construct to measure; – The measures are expected to be related (reliability - internal coherence) and semantically interchangeable; – Deleting an indicator from the measurement model does not alter the	– The direction of causality is from measure to construct; – The measures do not necessarily have to be related (the model does not imply internal coherence and it is preferable that the measures are not too related), therefore, the measures are not

meaning of the construct; – The measurement error is taken into account at the level of the individual item; – The construct exists at a higher level of abstraction than its measurements.	interchangeable; – Removing an indicator from the measurement model can alter the meaning of the construct; – The measurement error is taken into account at the construction level; – The construct exists on the same level as its measures.

Source: *Author's elaboration*

Regardless of the characteristics of the measurement model, however, its choice must necessarily be guided by theoretical reasons. In this regard, Jarvis et al. (2003) propose a series of conditions that guide the choice of reflective or formative measurement models:

- direction of the causal relationship;
- interchangeability of measures;
- covariation between items.

Edwards & Bagozzi (2000), also highlight the risks associated with the proposal of post-hoc formative measurements, considering it unacceptable that unsatisfactory results obtained in the evaluation of reflective scales lead to a change in the measurement model.

The possibility, particularly widespread in the Sem, that a variable may present itself as dependent and independent at the same time, makes it possible to refer to a new terminology able to include both exogenous and endogenous variables (Lin et al., 2005; Marks et al., 2005), the former able to indicate only independent variables, while the latter afferent to dependent variables that may be predictors of one or more other variables.

All this makes it possible to analyse the phenomena under investigation with greater clarity and precision, thanks to the construction of models capable of capturing the high degree of complexity and articulation that characterises reality.

In fact, since SEMs, unlike other statistical techniques, allow the inclusion of latent variables in the models subject to verification in a direct way, arriving at the measurement of the same through the use of multiple indicators subject to measurement errors (Raykov and Marcoulides, 2012; Guerrero et al., 2008), through their use it is possible to treat errors as relevant aspects of the entire model.

In this way, the influence exerted by these components on the relations between the variables of interest can be eliminated (Tommasetti et al., 2018; Tomás et al., 1999), ensuring a clearer understanding of the links between them.

In literature there are, moreover, different classes of models that cannot be estimated through a simple regression, because they are models that imply the existence of a chain of mediation between a plurality of variables rather articulated (eg: A → C → B), for which, while having the possibility to proceed through sequential regressions of the type: A → C and C → B, the statistics suggest that it would be more useful to proceed by simultaneously analysing the relationships between these variables, thus obtaining better results in terms of both greater precision of estimates and greater parsimony of the model.

As far as measurement errors are concerned, which are included in the model as an integral part of it, a distinction is made, as already mentioned, between the error of the equation, which is suitable for explaining that part of the variance of the dependent variable which is not explained by the independent variable, and the measurement error, which, instead, concerns the measurement model and may be linked to the quality of the data or to other problems closely related to the collection of the same (Schreiber et al., 2006; Homer et al., 1988).

The researcher should try to minimize this last component of error by carrying out a series of evaluations of the reliability and validity of each measurement scale (confirmatory factorial analysis). A measurement scale is reliable if it shows that it systematically represents the same phenomenon in a consistent manner in repeated measurements of the same (internal coherence and temporal coherence) and is, instead, valid if it shows that it represents the phenomenon of interest that was intended to be measured (validity of content, construct and criterion).

In other words, a measurement scale is reliable if the random error is zero and is valid if both the systematic error and the random error are zero. Therefore, a valid measurement scale is also reliable, but not the other way around.

Reliability is also assessed in terms of internal and temporal consistency. The first presupposes that the indicators are significantly and substantially correlated, thus expressing in a compact way the latent construct to be measured; the second implies that the indicators are able to systematically measure the same construct over time. In general, the internal coherence of a measurement scale is equal to the ratio of systematic and total variance.

The Cronbach alpha is the first index to be calculated to evaluate the internal coherence of a measurement scale, even if it is, in any case, sensitive to the number of items of the scale, since it increases as the number of the latter increases.

Other internal consistency indices are represented in the following Table 8 (Museus et al., 2008; Jöreskog, 1993):

Time consistency is tested less frequently in studies on the development of measurement scales for reasons of maturation and learning problems. However, it is still a good idea to check that the evidence on the indicators maintained at the advanced stages of the process are substantially stable.

Table 8: Additional internal consistency indices

Internal consistency indices	Description
Item-to-total correlation	Correlation of each item with the total score of the scale
Split-half reliability	The total set of items is divided in half and the scores obtained on the two halves are correlated
Alpha-if-item deleted	Provides, for each individual item, information on how Cronbach's Alpha would improve if it were eliminated
Composite reliability	To be calculated on the basis of the output of the CFA

Source: *Author's elaboration*

With regard to the validity of construct and criterion, it should be noted that they refer to the ways in which the scale of measurement of the construct of interest behaves in relation to other constructs. In particular, the validity of refers to how much the measures of a construct converge in measuring it and diverge from measures of different constructs. The validity of the criterion, on the other hand, refers to the ability of the measurements of a construct to predict or occur simultaneously with other constructs (De Vellis and Dancer, 1991). Two aspects are taken into account in the assessment of constructional validity: convergent validity and discriminatory validity, the specific characteristics of which are described in Table 9:

Table 9: Converging and discriminating validity

Types of validity	Features
Converging validity	- At the level of indicators, the items used to measure the construct must be significantly correlated with each other; - At the level of the measurement scale, the scale must be correlated to those of constructs that are supposed to be associated with the construct of interest (Peck & Childers, 2003)
Discriminating validity	- At the level of indicators, the items used to measure the construct must not be very correlated with items used to measure other constructs; - At the level of the measurement scale, the scale must not be very correlated with those of constructs that are supposed to be distinct from the construct of interest.

Source: *Author's elaboration*

The validity of a criterion consists in the ability of the construct that is to be measured to predict a "criterion" construct. In fact, one speaks of "predictive validity" if the objective is to establish that the construct causes a construct-criterion (Webster and Kruglanski, 1994), while the "concomitant validity" consists in verifying the correspondence in the manifestation of the construct of interest with respect to other constructs.

The assessment of the construct validity is made by estimating a confirmatory factorial model (Wong and Cheung, 2005; Tan, 2001). However, further

preliminary indications for the purification of the measurement scale can be obtained by the application of exploratory factorial analysis: factor loadings, extracted variance, possible factorial structure between several dimensions.

Exploratory factorial analysis is applied to analyze the relationships between observed variables in order to identify a latent structure. The objective is to synthesize a number "m" of items in "n" factors (or components), with m > n. In fact, in the process of developing the measurement scale, the exploratory factorial analysis allows to have a first estimate of factor loadings and to verify the opportunity for further purification of the scale.

The application of the EFA makes it possible to make an initial assessment of the factorial structure of interest. It is also possible to further purify the measurement scale(s), excluding indicators that show low factor loadings on the expected factor or substantial cross loading. In this way, it is possible to obtain a thrifty structure to be submitted to the confirmatory test. In the case of multiple dimensions, exploratory factorial analysis (EFA) offers, unlike reliability analyses, an initial indication of the relationships between dimensions. It, like the PCA, is expressed in matrix form and makes it possible to explain the total variance of the indicators, expressed as the sum of the common variance, the unique variance and the variance of the error.

More specifically, the EFA foresees that the factors only explain the common variance, while the PCA aims to explain the total variance. The latter is more suitable for analyses in which the objective is to obtain a model that explains the highest possible percentage of variance (O'Rourke et al., 2013; Byrne, 2013). The extraction of the factors takes place, in any case, in a hierarchical way. The first explains most of the variance, the second most of the residual variance and so on. Generally, the unrotated solution is not easy to interpret and, for this reason, we tend to apply an orthogonal or oblique rotation of the axes. The orthogonal

rotation methods (e.g. varimax) require that the factors are related to each other, which is very useful when using factorial scores for subsequent analysis (regression, cluster analysis, etc.).

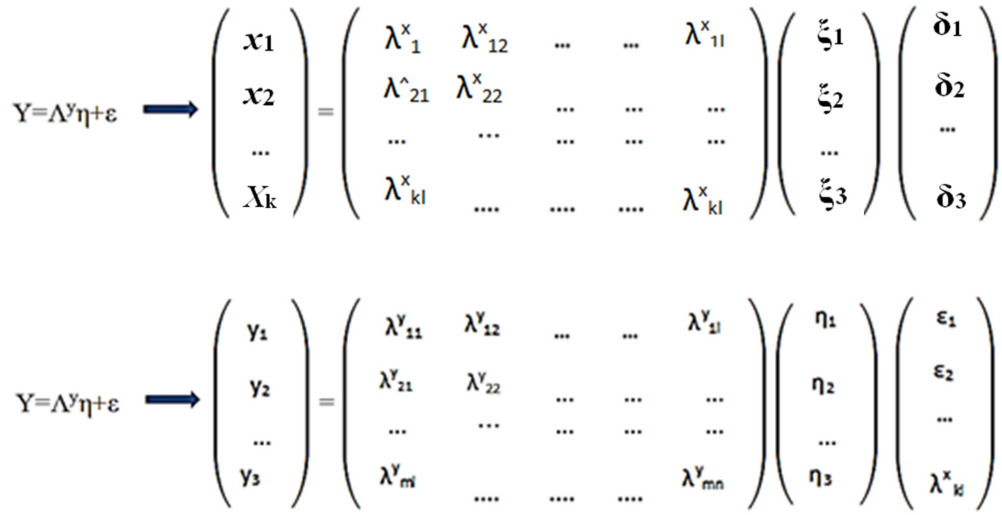
The methods of oblique rotation (e.g.: promax) require, instead, that the factors are correlated with each other, being preferable when it is believed that the factors share some form of association (Sarstedt et al., 2017; Bollen and Long, 1992). In the orthogonally rotated solution, the interpretation of factors is based on the matrix of rotated factorial coefficients. In the solution rotated obliquely, the interpretation of factors is based on the pattern matrix, which contains the factorial coefficients; unlike the matrix of structure, typical of the solution rotated orthogonally, which contains the correlations between factors and indicators (Lattin et al., 2003).

3.3.2 The measurement model

In the measurement model, the λx parameters (lambda-x) express the linear link between the latent exogenous variables (ξ) and the observed variables x. Similarly, the λy parameters (lambda-y) express the linear link between the endogenous latent variables (η) and the observed variables y.

As shown below, λx (lambda-x) parameters are contained in the matrix of order k*l, which is indicated by the capital Greek letter Λx, while λy parameters are contained in the matrix of order m*n, which is indicated by the capital Greek letter Λy:

Figure 5: The measurement model



Source: *Author's elaboration*

The matrix of variances-covariances between stochastic errors δ (delta) is indicated by the capital Greek letter "Theta-delta", while the elements of the matrix are indicated by the same lowercase letter (theta-delta). This is essentially a symmetrical matrix of the order k*k which, in most cases, must be specified as diagonal, thus estimating the variances of the errors and fixing the covariances between them equal to zero (Keith, 2014).

Instead, the matrix of variances-covariances between stochastic errors (epsilon) is indicated by the capital Greek letter "Theta-epsilon", while its elements are indicated by the same lowercase letter (Theta-epsilon). Also in this case, it is a symmetrical matrix of the order m*m, which must, in most cases, be specified as diagonal (the variances of the errors are estimated and the covariances between them are fixed at zero).

Figure 6: Matrix of variances-covariances between measurement errors

$$\vartheta^{\delta}=\begin{pmatrix} \vartheta^{\delta}_{11} & \cdots & \cdots & \cdots \\ \vartheta^{\delta}_{21} & \vartheta^{\delta}_{22} & \vdots & \cdots \\ \cdots & \cdots & \cdots & \cdots \\ \vartheta^{\delta}_{kl} & \cdots & \cdots & \vartheta^{\delta}_{kk} \end{pmatrix}$$

$$\vartheta^{\varepsilon}=\begin{pmatrix} \vartheta^{\varepsilon}_{11} & \cdots & \cdots & \cdots \\ \vartheta^{\varepsilon}_{21} & \vartheta^{\varepsilon}_{22} & \cdots & \vdots \\ \cdots & \cdots & \cdots & \cdots \\ \vartheta^{\varepsilon}_{ml} & \cdots & \cdots & \vartheta^{\varepsilon}_{mm} \end{pmatrix}$$

Source: *Author's elaboration*

The Models of Structural Equations also consider a further matrix of variances-covariances between the latent exogenous variables (ξ), which is presented as a symmetrical matrix of the order lxl. It is indicated by the capital Greek letter Φ (phi) and the elements that make it up are indicated with the same letter, but lowercase (φ).

Figure 7: Matrix of variances-covariances between latent exogenous variables

$$\Phi=\begin{pmatrix} \phi_{11} & \cdots & \square & \square \\ \phi_{21} & \phi_{22} & \square & \vdots \\ \cdots & \cdots & \cdots & \square \\ \phi_{l1} & \cdots & \cdots & \phi_{ll} \end{pmatrix}$$

Source: *Author's elaboration*

3.3.3 The structural model

The complete form of the Models of Structural Equations aims to estimate causal relationships between the following types of variables (Raykov and Marcoulides, 2012; Schreiber et al., 2006; Cadell et al., 2003):

Exogenous latent variables (ξ) and endogenous latent variables (η); in this case, the causal parameter is represented by the Greek letter γ (gamma); these causal parameters are contained in the matrix of order n*l, which is generally indicated by the Greek capital letter Γ (gamma); the causal parameters of endogenous latent variables are represented by the Greek letter β (beta) and are contained in the matrix of order n*n, which is indicated by the Greek capital letter B (beta).

In both cases, the dependent variable is always an endogenous latent variable (η). The equation able to describe the structural model and its matrix representation are indicated below:

$$\eta = B\eta + \Gamma\xi + \varsigma$$

Figure 8: Generic equation describing structural model and its matrix

$$\begin{pmatrix}\eta_1\\ \eta_2\\ \dots\\ \eta_n\end{pmatrix}=\begin{pmatrix}0 & \beta_{12} & \dots & \beta_{In}\\ \beta_{21} & 0 & \dots & \vdots\\ \dots & \cdots & 0 & \dots\\ \beta_{nl} & \dots & \dots & 0\end{pmatrix}\begin{pmatrix}\eta_1\\ \eta_2\\ \cdots\\ \eta_n\end{pmatrix}+\begin{pmatrix}\lambda_{11} & \lambda_{12} & \dots & \dots & \lambda_{1l}\\ \lambda_{21} & \lambda_{22} & \dots & \dots & \dots\\ \dots & \dots & \dots & \dots & \dots\\ \lambda_{nl} & \dots & \dots & \dots & \lambda_{nl}\end{pmatrix}\begin{pmatrix}\xi_1\\ \xi_2\\ \dots\\ \xi_l\end{pmatrix}+\begin{pmatrix}\zeta_1\\ \zeta_{21}\\ \dots\\ \zeta_n\end{pmatrix}$$

Source: *Author's elaboration*

In a regression model, the distinction between variables (η) and variables (ξ) has no reason to exist, since, in such models, there is only one dependent variable and

all the others, instead, are independent (Grimm et al., 2016; Newsom, 2015; Hwang and Takane, 2014).

As for the matrix of variances-covariances between stochastic errors ς (zeta), it is indicated by the capital Greek letter Ψ(psi), while its elements are indicated by the same lowercase letter (ψ); it is, in essence, a symmetrical matrix of order n*n:

Figure 9: Symmetrical matrix of order n*n

$$\Psi=\begin{pmatrix} \Psi_{11} & \dots & \dots & \dots \\ \vdots & \Psi_{22} & \dots & \dots \\ \dots & \dots & \dots & \dots \\ \Psi_{nl} & \dots & \dots & \Psi_{nn} \end{pmatrix}$$

Source: *Author's elaboration*

In the development of the Models of Structural Equations, a series of particularly important assumptions must also be respected:

- δ related to ς;
- ε correlates with η;
- ς in conjunction with η and ξ;
- all stochastic errors (δ, ε, ς) are mutually correlated;
- the observed variables jointly follow the normal multivariate distribution;
- the observations are independent.

From the first three assumptions, it can be seen that errors are independent of independent variables and, therefore, are random, as they are also random among themselves (Guerrero et al., 2008; Marks et al., 2005). As for the fact that the variables observed follow the normal multivariate distribution, it should be

stressed that in the datasets of the social sciences this assumption is always violated, since the method of maximum likelihood is defined as robust to minor violations of this assertion. Finally, the fact that there are no subgroups explains why the observations are presented as independent.

In the Models of Structural Equations, the parameters contained in the matrices Λx, Λy, Γ, B, Φ, Ψ, ϑδ and ϑε can be treated in different ways:

- free parameters: parameters that are estimated;
- fixed parameters: parameters that are fixed at a certain value, most of the time at zero;
- constrained parameters: parameters that are fixed equal to other parameters, i.e. expressed as a function of other parameters.

The latent variables ξ and η, since they are not directly observed, do not have a known unit of measurement. In order to be able to solve this problem, it is possible to follow some alternative procedures:

- set, for each latent variable, an observed variable defining the unit of measurement: for each latent variable, a lambda parameter equal to one is imposed;
- standardize the exogenous latent variables (ξ), fixing their variance (Φij) equal to one. In this sense, it is opportune to underline how the recent versions of Lisrel automatically standardize the latent variables for which one of the two procedures described above has not been followed.

The exogenous latent variables, in fact, should be measured through multiple indicators, even if there are cases in which there could be the interest of the researcher to include in the model latent variables with a single indicator, making it necessary to set some parameters (Henseler et al., 2015; Wisner, 2003). In fact, if the single indicator measures the latent variable without error (e.g. age, income, etc.), the relative lambda parameter is set to one and the variance of the relative

measurement error to zero. Also, if the single indicator measures the latent variable with some unknown error, the relative lambda parameter is set to one and the variance of the relative measurement error to some value, while if the single indicator measures the latent variable with some known error (e.g. an error detected by previous studies), the relative lambda parameter is set to one and the variance of the relative measurement error α (1- α)* var (x).

3.3.4 Specification and estimation models

The Models of Structural Equations consist of a series of linear equations, through which the measurement model (estimation of the relationships between the latent variables and their indicators: CFA) and the structural model in the strict sense (estimation of the causal relationships between latent variables: causal analysis) are estimated simultaneously. Therefore, by applying the necessary restrictions to the complete model, the following operations can be carried out (Tommasetti et al., 2018):

- estimate only the measurement model, i.e. proceed to the application of the Confirmative Factor Analysis;
- estimate only the structural model, i.e. apply path analysis to constructs with unique measures;
- Simultaneously estimate the measurement model and the structural model, i.e. apply causal analysis between latent variables.

In full form, the SEMs include:

- Four types of variables: exogenous latent, endogenous latent, exogenous observed and endogenous observed;
- Four matrices of parameters;
- A matrix of variance-covariances between latent exogenous variables;

- Three matrices of variance-covariances between stochastic errors.

The latent variables that act exclusively as independent variables in the model are called exogenous and are represented by the Greek letter ξ (csi or xi); those, instead, observed that measure the latent exogenous variables are represented by the letter x. The latent variables that in the model act in at least one relation as dependent variable are called endogenous and are represented by the Greek letter η (eta), while the observed variables (items) that measure the latent endogenous variables are represented by the letter y.

In the complete form of the Models of Structural Equations, the measurement model exists, both for latent exogenous variables and for endogenous ones. In the case of a confirmatory factorial analysis, only the measurement model of the exogenous latent variables is estimated and not also the causal relationships between latent variables.

In order to subject the SEM to confirmatory testing, it is necessary that it be specified, defining its fixed and free parameters on the basis of both theoretical and methodological considerations. From these parameters it is possible, then, to define the matrix of the variance-covariances between the observed variables, better called as implied matrix.

The estimation process, instead, is oriented to the identification of the values of the parameters aimed at minimizing the gap between the observed variance-covariance matrix "Σ" and the implied one "Σ(ϑ)".

In fact, Models of Structural Equations are estimated using the Maximum Likelihood (ML) method. The objective is to reconstruct, through a series of iterations, the matrix of variance-covariances implied by the model, Σ(ϑ).

The null hypothesis of a Structural Equation Model is as follows:

$$\Sigma = \Sigma(\vartheta)$$

The ML function (to be minimized) expresses the difference between Σ and Σ(ϑ) and is distributed as:

$$(N-1)^* \text{ FML} \sim X^2 [1/2 (p+q) (p+q+1) - t]$$

The parameters estimated by this method, with $N \rightarrow \infty$, are invested with the following properties (Lin et al., 2005):

- unbiased: the estimated parameters approximate the parameters in the population;
- consistent: the larger the sample, the smaller the confidence intervals of the parameters;
- efficient: there are no other estimates with lower standard errors;
- The parameters follow the normal distribution (t-test).

In the event that the indicators do not comply with the assumption of multivariate normality, a series of corrections must be made as follows (Bandalos, 2002):

- transforming so-called problem variables by means of natural logarithms, square roots, etc.;
- aggregate indicators;
- use other methods of distribution-free estimation.

In any case, it should be noted that the ML has been subjected to studies that have proven its robustness even with violations (not excessive) of the assumptions.

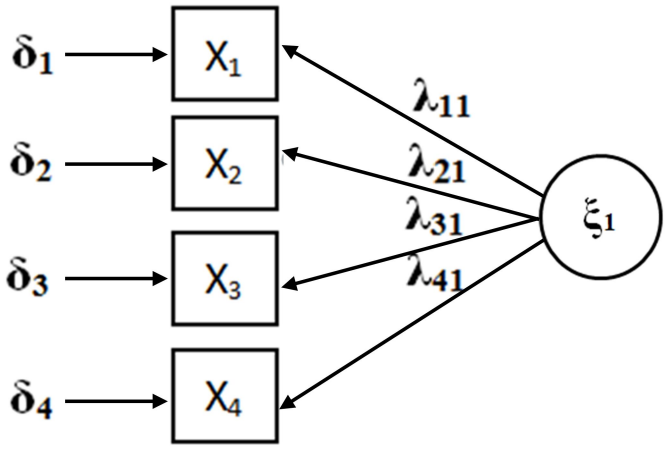
A theoretical model is identified if all the parameters to be estimated can be expressed as a function of the variance-covariances between the observed variables.

Similarly, each linear equation of a Structural Equation Model must be identified, i.e. it must have more information than the number of unknowns. In an unidentified model, multiple sets of parameters can be obtained that meet the estimation function.

A possible example of a measurement model is shown in the figure 10.

In the model of measurement, there are eight unknowns; therefore, considering the hypothesis of fixing one of the lambda parameters to one (so as to provide a unit of measurement to the latent variable), three lambda parameters, one phi parameter and four theta-delta parameters must be estimated. Moreover, the pieces of information to be counted are the variances-covariances "unique" in input. With 4 indicators, 10 pieces of information can be obtained (4 variances + 6 covariances); therefore, the model is identified, as 10 - 8 = 2.

Figure 10: An example of a measurement model



Source: *Author's elaboration*

All the conditions for the identification of a model are described in table 10:

Table 10: Conditions for the identification of the measurement model

Rule	Terms and conditions	Required condition	Sufficient condition
T-rule	- $t \leq 1/2\, p(p+1)$	Yes	No
Three Indicator Rule	- $n \geq 2$; - Three or more indicators per factor; - One non-zero element per line of the Λ^x matrix; - ϑ^δ diagonal	No	Yes
Two Indicator Rule	- $n \geq 2$; - Two or more indicators per factor; - One non-zero element per line of the Λx matrix; - ϑ^δ diagonal - $\Phi ij \neq 0$ for at least one pair i,j with $i \neq j$, for each latent variable	No	Yes

Source: *Author's elaboration*

The conditions for the identification of the structural model are given in table 11:

Table 11: Conditions for the identification of the structural model

Rule	Terms and conditions	Required condition	Sufficient condition
T-rule	$t \leq ½ (p+q) (p+q+1)$	Yes	No.
No rule.	$B = 0$	No.	Yes
Recursive rule	B triangular, Ψ diagonal	No.	Yes
Order condition (for each equation)	Restrictions in $C \geq \neq \eta - 1$ (matrix C is equal to $[(I - B) - \Gamma]$ with Ψ symmetrical, free	Yes	No.
Rank Condition (for each equation)	The rank of the matrix $C = \neq \eta - 1$ (matrix C equals $[(I - B) - \Gamma]$ with Ψ symmetrical, free.	Yes.	No.

Source: *Author's elaboration*

Summarizing, therefore, the conditions for the identification of the model, understood in a general sense, can thus be listed:

- the specified model must provide for related errors;

- the specified model must be recursive;
- latent variables must be measured by an appropriate number of indicators and have a unit of measurement;
- the observed variables measure only one latent variable.

A Structural Equation Model may not be empirically identified if a "substantial" parameter tends empirically to zero. This results in unacceptable estimates, such as negative variances (heywood case), or covariances between two variables greater than the variance of at least one of the variables.

In this sense, Dillon et al. (1987) suggest that a negative variance could be due to stochastic oscillations if all the following conditions occur:

- the confidence interval of the variance under examination contains zero;
- the fit of the model is reasonable;
- the standard errors of similar parameters are comparable to that of the parameter under consideration.

In order to determine whether the fit of a model is reasonable, its evaluation (both CFA and complete structural model) must be carried out by means of chi-square statistics, capable of expressing the deviation $\Sigma - \Sigma(\vartheta)$.

The aim is, in fact, to test the null hypothesis $\Sigma - \Sigma(\vartheta) = 0$, starting from the observation that:

$$X^2 \text{ model} = (N-1)* \text{FML} \sim X^2 (1/2 (p+q)(p+q+1)-t)$$

There are both absolute and incremental fit indices. The latter, in particular, are based on the comparison between the chi-square of the estimated model (m) and the chi-square of a null model (b), as shown in table 12:

Table 12: Fit indexes

Absolute fit indexes	**Incremental fit indexes**
X^2 / df	NFI = $\frac{X_b^2 - X_m^2}{X_b^2}$
GFI = 1 - $\frac{tr\,[(\Sigma^{-1}(\theta)S - I)^2]}{tr[(\Sigma^{-1}(\theta)S)^2}$	TLI = $\frac{X_b^2/df_b - X_m^2/df_m}{(X_b^2/df_b) - 1}$
AGFI = 1 - [k(k+1)/2t] (1 - GFI)	CFI = 1 - - $\frac{\tau_k}{\tau}$ where τ_k = max ($X_m^2 - df_m$, 0) e τ_j = max (X_m^2-df_m, X_b^2 - df_b, 0)
RMR = [2 $\Sigma i_{\Sigma J}$ [$\frac{(Sij - \sigma ij)^2}{k\,(k+1)}$]$^{1/2}$	So, very often: CFI = 1 - $\frac{(X_m^2 - df_m)}{(X_b^2 - df_b)}$
RMSEA = $\sqrt{\frac{(X^2 - df)}{df(N-1)}}$	

Source: *Author's elaboration*

The fit indices contained in the table make it possible to express assessments regarding the validity of the model in representing the reality being analysed. Each index must have values that fall within a threshold of acceptability.

In particular, among the absolute fit indices, the first three (X^2 / df; GFI and AGFI) must have values > 0.90. They are rarely used as they are only significant for high sample units. The RMR represents, instead, the square root of the average residue, of which there is also a standardized version and, finally, always among the absolute fit indexes, the RMSEA (Root of Mean Square Error of Approssimation)

is relevant, which represents an approximate fit index, based on residues, whose values must be less than 0.06 (Hu and Bentler, 1998).

3.3.5 Convergent validity and discriminating validity of latent variables

In addition to the evaluation of the overall goodness, the estimation of a measurement model requires the evaluation of the convergent and discriminating validity of the latent variables, for the determination of which it is possible to refer to two types of instruments (Stein et al., 2017):

- Composite Reliability (pc);
- Average Variance Extracted (AVE).

These two indices are calculated as follows:

$$pc = \frac{(\sum_i \lambda_i)^2 \text{ var } \xi}{[(\sum_i \lambda_i)^2 \text{ var } \xi + \vartheta ii]}$$

$$AVE = \frac{(\sum_i \lambda_i)^2 \text{ var } \xi}{[(\sum_i \lambda_i)^2 \text{ var } \xi + \sum_i \vartheta ii]]}$$

It is possible to state that there is convergent validity for each latent variable if:

- the estimated lambda parameters (or range, in the case of a second-order model) are significant and substantial;
- for each latent variable, Composite Reliability is > 0.70 and AVE è > 0.50.

As far as the discriminating validity is concerned, instead, for each pair of latent variables, it is necessary that:

$$\text{AVE}_{\xi 1} > \Phi_{221}$$

$$\text{AVE}_{\xi 2} > \Phi_{221}$$

Chapter IV

The analysis

4.1 Research Design; **4.1.1** The hypotheses of the model; **4.1.2** Constructs Measurement and Questionnaire Development; **4.1.3** Sampling and data collection; **4.1.4** Data elaboration; **4.2** Findings; **4.3** Results discussion; **4.4** Implications: theoretical advancement and managerial insights.

4.1 Research Design

As stated within the introduction, the thesis focuses on the concept of Open Government Data (OGD) as a new approach to the management of Public administrations (Pereira et al., 2017; Wang and Lo, 2016; Zuiderwijk and Janssen, 2014; Attard et al., 2015; Chan, 2013), based on the use of technologies for data treatment capable of favouring the affirmation of logics characterized by transparency, citizens' participation and collaboration in processes, activities and services of the public sector (Dawes et al., 2016; Gonzalez-Zapata and Heeks, 2015; Ubaldi, 2013; Shadbolt et al., 2012).

In particular, the objective of the work is to deepen the aspects and conditions enabling the management of Public Administration (PA) according to the OGD, as well as the impact of this approach on the quality of the public service provided to the community.

To achieve the goal above described, a quantitative approach was used, based on the test of a Structural Equation Model (SEM), capable of verifying empirically, and above all, simultaneously, the relationships existing between the variables of the proposed model. SEMs are a very common analysis technique in literature and are often used to test models in different fields of social and behavioral sciences (Ullman and Bentler, 2012).

The adoption of SEMs involves the realization of a series of consecutive and preparatory phases: the specification of the theoretical model to be tested; the parameter estimation and evaluation; and the test of the final model. The development of the phases is iterative in the sense that the sequence has to be repeated several times until the identification of an acceptable model.

The objective of the SEMs, as a multivariate statistical analysis technique, is to allow the verification of hypotheses concerning the influence of a set of variables on others (Gefen et al., 2000).

In other words, the SEMs enable the study of the linear relations between one or more independent variables and one or more dependent variables, which can be objectively observable or not directly observable and, as such, latent; in this case, these are variables that are measured indirectly through a series of detectable indicators (items). The items coincide with the statements contained in the questionnaire submitted to the respondents.

The choice to employ a modelling based on structural equations and not on linear regressions is very simple: to study some phenomena, especially the complex ones, it is more appropriate to simultaneously analyse the relationships existing between all the considered variables, being able to obtain, in in this way, better results both in terms of greater accuracy of the estimates and higher parsimony of the model (Gefen et al., 2000). In other words, the use of this analysis technique is due to the consideration that SEM allows overcoming the main limitation of

regression models, represented by the impossibility of simultaneously verifying the causality among several variables.

4.1.1 The hypotheses of the model

On the basis of what was widely discussed in chapter II, the work aims to verify whether and how much each of the variables that constitute the pillars of the Open Government Data (transparency of Public administrations' activities - TRA -, citizens' participation in Public administrations' activities - PAR -, and citizens' collaboration to Public administrations' activities - COL -) impact on perceived service quality - QUA -, that is, on the quality of public service perceived by citizens.

The quality of public service has been a topic widely discussed in the literature. In fact, numerous studies (Cronin and Taylor, 1992; Rust and Oliver, 1993; Taylor and Baker, 1994; Zeithaml et al, 1996; Boulding et al, 1993), relate this construct to others that are particularly widespread, such as company performance, customer satisfaction and their behavioural intentions.

Williams and Calnan (1991), for example, point out that the perception of quality of service by users of the health care system is a critical factor for the success of health care organizations, precisely because of the important role played by this variable on patient satisfaction and the income balance of public companies.

In this regard, Grönroos (1983) stresses that the perceived quality of the service is composed of two interlinked dimensions: a technique, concerning the type of service provided, and a functional one, concerning the manner in which the service is actually provided. These dimensions therefore allow users to assess the service provided, even though they very often do not have the level of knowledge

and skills required to enable proper understanding and assessment of the service provided (Williams, 1994). For this reason, users of public services (citizens) very often base their assessments on non-technical processes, which are more closely linked to the relationship established with the providers of these services (Public administrations).

For a more adequate perception of the quality of the service, Parasuraman et al. (1985) propose the "Expectancy/Disconfirmation Model", thanks to which it is possible to proceed with the evaluation of the quality of the service through a comparison between the perception of the service received and the expectations of the user-user. However, this model does not seem to be particularly suitable in certain contexts, such as, for example, the health sector, as it frequently happens that patients do not have the appropriate tools to properly form expectations regarding the quality of the services they will receive (Fitzpatrick and Hopkins, 1983).

In the light of what has been written so far, it emerges that the evaluation of the perceived quality of the service provided by Public administrations is not easy, especially since it is impacted by many variables, some of which are not controllable by managers. For the sake of simplicity of reasoning, while remaining in the health sector, one thinks, for example, of the scarcity of economic resources for the possible purchase of a useful machine to carry out diagnoses that would otherwise be impossible. Of course, the availability of economic resources is a variable that depends on many factors, some of which do not depend on the will/ability of the management (e.g. political choices at regional or national level).

In addition to the uncontrollable variables, however, there are other variables on which the Public Administration could and should act in order to ensure an improvement in the quality of public service perceived by citizens.

These include the pillars of Open Government Data:

- Transparency of Public administrations' activities: according to Davies and Bawa (2012), transparency is the result of the institutions' choice to provide citizens with data and information on decisions taken and their actions. The objective pursued by the Public administrations that adopt a management model oriented to transparency is to create a system of trust in citizens-users respect capable of encouraging the improvement of the perceived quality of services provided (Shadbolt et al., 2012; Janssen, 2011; Bates, 2014). In the last two decades much has been done to make the Public Administration transparent, often through the issuing of directives, regulations and laws that impose obligations of transparency on public bodies. However, operational practice shows that these obligations, although necessary, are not always sufficient for a truly transparent PA (Jetzek et al., 2014).

  This is mainly due to the fact that the obligations can be fulfilled (as has often been the case, not only in Italy) or fulfilled in a mild way, affecting the transparency of the activities and processes of the Public Administration and, consequently, the quality of service perceived by citizens (Böhm et al., 2012). To complicate the situation, especially in recent times, it should also be considered that the amount of data with which the PA is faced daily makes it difficult to ensure absolute transparency, at least not in a timely manner or usable by citizens. Guaranteeing transparency is also an objective to be pursued by virtue of the fact that, at least from a theoretical point of view, it also conditions the willingness and willingness of citizens-users to actively participate in the various phases of the process of using public service. In the light of the above considerations, this work aims to investigate whether:

H_1: *Transparency of Public administrations' activities affects perceived service quality.*

H_2: *Transparency of Public administrations' activities affects citizens' participation.*

- Citizens' participation in Public administrations' activities; the collaboration between institutions and citizens in the decision-making processes of the Public Administration represents one of the central nodes of the Open Government Data, able to guarantee the improvement of the quality of the political-administrative choices of public bodies (Geiger and von Lucke, 2011). In fact, allowing citizens to participate in the process of providing services, for example through the proposal of interventions to be carried out, ensures a supply more in line with their actual needs (Wang and Lo, 2016).

  However, although the relevance of citizen participation in the life of Public administrations is widely recognised, to date, participatory PA management models are rather outdated and can be traced mostly to attempts or experiments very far from how they should be (Parycek et al., 2014). Very often participatory processes have been constructed in an approximate way, more with the aim of generating approval and consensus, resulting in no or marginal impact (Kucera and Chlapek, 2014).

  The reason for the failure of participatory models is mainly related to the lack of a clear and well-defined protocol, which guides the bodies of the Public Administration towards a participatory opening for the benefit of citizens, in order to stimulate a better perception of the public services used (Jetzek et al., 2012). This consideration is supported by the fact that, in some contexts and with reference to certain activities, the participatory

model is effective, as demonstrated by the so-called "participatory budgets", which have also been successfully adopted in Italy.

Therefore, public participation should be guided by clear steps, from the proposal of the actions to their concrete implementation. On the basis of what has been described so far, through the analysis of a Structural Equation Models, the thesis aims to verify whether:

H_3: *Citizens' participation in Public administrations' activities affects perceived service quality*.

- Citizens' collaboration to Public administrations' activities: the dimension of the Open Government Data most closely related to participation is collaboration. (Reddick and Ganapati, 2011). Their linkage is so strong that it is often unclear whether some models of public authority management are geared towards collaborative participation or participatory collaboration (Martin et al., 2013).

  However, there is a difference between them (Hossain et al., 2018): participation could be considered as the tool that uses the resources (economic, temporal, cognitive, etc.) made available to citizens to facilitate the taking of political decisions and government services (Veljkovic et al., 2014); collaboration, instead, can be perceived as the commitment of citizens, businesses and government agencies in complex tasks or projects that aim to produce specific results (Lee and Kwak, 2012; Veljkovic et al., 2014).

  The collaboration, therefore, should be understood not only between citizens and Public administrations, but also between the PA bodies

themselves, which are part of a collaborative and participatory network composed of many stakeholders (communities of citizens, families, private companies, associations of various kinds, non-profit organizations and other public bodies). In any case, beyond any similarities and differences between the two concepts, it should be stressed that, as stated by Craveiro et al. (2016), multistakeholder collaboration, as well as participation, contributes significantly to improving the performance of public bodies and this could have a positive impact on the public services provided. In this regard, this thesis work is intended to verify whether, in practice:

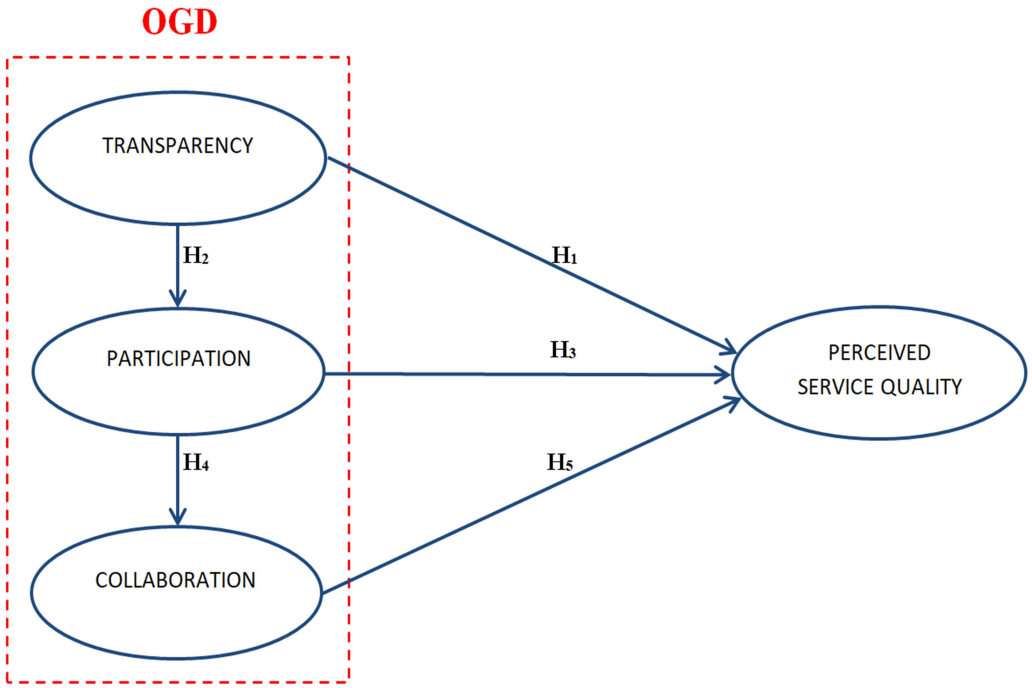
H_4: *Citizens' participation in Public administrations' activities affects their collaboration*.

H_5: *Citizens' collaboration to Public administrations' activities affects perceived service quality*.

From this formulation, it can be deduced that transparency of Public administrations' activities, citizens' participation in Public administrations' activities and citizens' collaboration to Public administrations' activities represent the independent variables of the model, that is, those that influence another variable without being influenced in turn. Instead, perceived service quality, i.e. the quality of public service perceived by citizens, represents the dependent variable of the Structural Equation Models tested, i.e. the variable that is influenced by the other variables.

Figure 11 provides a graphical representation of the theoretical model tested with its independent variables and the dependent variable:

Figure 11: Theoretical model and variables



Source: *Author's elaboration*

4.1.2 Constructs Measurement and Questionnaire Development

All constructs of the model were measured by using multiple indicators adapted from previous studies.

In particular, "transparency" was measured by adapting the 4-item scale originally proposed by Hossain et al. (2018), including the following items: "Information provided by OGD should cover all issues needed"; "Information provided by OGD should be relevant to what citizens"; "Government should make information accessible to all citizens"; "Government should make information accessible all time".

"Citizen participation" was measured by adapting and integrating the scale proposed by Harrison and Sayogo (2014), with the following 3 items: "Government delivers information to citizens regarding their decisions and actions"; "Government involves reaching and supporting citizens to access information"; "Government should include citizens in decision-making process".

To measure "citizen collaboration", an adaptation of the 4-items scale proposed by Abu-Shanab (2015) was adopted: "Partnership perception should prevail with citizens, businesses and other civil society bodies"; "Feedback for all communication and actions should be sent to all related/interested parties"; "Government based on citizen's collective feedback and participation does decision-making"; "Improved ICT tools should be implemented to accommodate collaboration function".

Finally, "perceived service quality" was measured by using the scale introduced by Lee et al. (2000), composed of 3 items: "The service quality of this institution is very low"; "The service quality of this institution is excellent"; "The service quality of this institution is likable".

Hereinafter, the table 13 synthetizes all the measurement scales used for the analysis:

Table 13: The measurement scales used for the analysis

Construct name	Measurement items	Source
Transparency	• TRA1: Information provided by OGD should cover all issues needed; • TRA2: Information provided	Hossain et al., 2018

	by OGD should be relevant to what citizens; • TRA3: Government should make information accessible to all citizens; TRA4: Government should make information accessible all time.	
Citizen participation	• PAR1: Government delivers information to citizens regarding their decisions and actions; • PAR2: Government involves reaching and supporting citizens to access information; • PAR3: Government should include citizens in decision-making process.	Harrison and Sayogo, 2014
Citizen collaboration	• COL1: Partnership perception should prevail with citizens, businesses and other civil society bodies; • COL2: Feedback for all communication and actions should be sent to all related/interested parties; • COL3: Government based on citizen's collective feedback and participation does decision-making; • COL4: Improved ICT tools should be implemented to accommodate collaboration function.	Abu-Shanab, 2015

Perceived service quality	• QUA1: The service quality of this institution is very low; • QUA2: The service quality of this institution is excellent; • QUA3: The service quality of this institution is likable.	Lee et al., 2000

Source: *Authors' elaboration*

The set of the items used to measure the various constructs above indicated constituted the starting point for the construction of the questionnaire subsequently administered to Campania's citizens. The items were ordered randomly to avoid problems linked to the response set. For each item, respondents had the opportunity to indicate how much they agreed with the statements. Specifically, a 7-point Likert scale was used in the questionnaire ranging from 1 (to indicate a strong disagreement) to 7 (to indicate a strong agreement). The choice to resort to a 7-point scale was due to the fact that, in many cases, as demonstrated by Joshi et al.'s study (2015), it had the highest eigenvalue for the factors and the highest cumulative percentages of variations explained.

4.1.3 Sampling and data collection

The data to be subsequently analyzed were collected by administering questionnaires to a convenience sample: although no selecting filter (for example, by gathering answers only from people of a certain age or with specific preferences, experiences, values, and so forth) was used, since filters are potentially able to influence the results, no proper specific technique of random

sampling was applied (such as simple random sampling, systematic random sampling, stratified random sampling, cluster sampling, and multistage sampling).

The questionnaires were administered in the five provinces of Campania, a southern Italian region: Naples, Salerno, Caserta, Avellino, and Benevento. The questionnaires were administered manually over a period of about one year, from January 2018 to December 2018.

Table 14 summarizes the personal features of the respondents:

Table 14: Respondents' personal features

Feature	Distribution
Gender	51.7% Bad 48.3% Female
Age	$18 \leq 16\% \leq 29$ $30 \leq 39\% \leq 49$ $50 \leq 27\% \leq 69$ $18\% \geq 70$
Education	0.2% Elementary school 10.8% Middle school 38% High school 26% Bachelor's degree

	22% Master degree 3% Other (Ph.D., Master, Professional course, etc.)
Occupation	37% Employee 29% Freelance 13% Unemployed 9% Student 12% Retired

Source: *Authors' elaboration*

As it is possible to observe in the table, the number of graduates obtained by adding respondents with either a bachelor's degree, master's degree, or other (Ph.D., Master, Professional course, etc.) is 51%. This percentage is much higher than the average percentage of graduates in Italy, which is around 20.9% (source: https://www.istat.it/it/files//2014/10/ItaliaInCifre2014.pdf). The difference (almost 30%) between the average national data and the data related to the sample used in terms of education provides evidence that it was a non-probability sample. Therefore, the sampling cannot be considered properly as random.

Before proceeding to the definitive administration of the questionnaires, a pre-test carried out: to verify the clarity of the questionnaire, it was preliminarily submitted to a small sample of people. The pre-test highlighted the need to make changes to increase the comprehensibility of the questionnaire. Participation in the study was voluntary and completely anonymous.

Overall, 567 questionnaires were effectively distributed. Of these ones, 391 were effectively used for the analysis. A total of 176 questionnaires were discarded: 91 for problems related to the response set; and 85 for reasons due to the incompleteness of the answers provided.

4.1.4 Data processing

The data emerging from the administration of questionnaires were processed with LISREL, version 8.80 for Windows, developed by Scientific Software International Inc. in Skokie, Illinois. It is a statistical software that enables structural equation modelling for both latent and manifest variables.

The use of Lisrel required the writing of a specific syntax and the realization of a series of operations that can be ordered in the following sequence:

- preparation of input data: raw data to be imported (in ".psf" format), covariance matrix, text files in free format;
- syntax writing;
- saving the output in separate files (words, notes);
- possible syntax modification and re-analysis.

As far as data preparation is concerned, first of all it was necessary to transform the original data file (in ".xls" format) into a file suitable for Lisrel (in ".psf" format). Although not strictly necessary, for simplicity's sake, the source file was created by including only the data with the observed variables of the model to be estimated[1].

[1] This procedure is preferable in almost all cases, unless there are structured data only in the form of a matrix of variances-covariances between the variables observed.

To avoid complications, the ".psf" file has been renamed "filedati", without spaces or special characters, and has been saved in a destination folder that is easy to reach (i.e. with a short path).

Subsequently, the missing data was processed before it was imported into Lisrel. Two additional software packages, IBM SPSS Statistics (version 23 for Windows) and Microsoft Excel (version 2013), were used for this purpose, providing greater flexibility for data management and manipulation.

This procedure required a number of checks:

- verification of the percentage of missing data for each observation;
- verification of the relevant frequency distribution;
- verification of the threshold limit above which observations may be deleted.

The missing data have been replaced by the regressive method[2]:

$$[Xmissing = f(X_1,....X_m)].$$

As mentioned above, estimating a Structural Equation Models with Lisrel requires writing a syntax: File → New → Lisrel Project. The syntax file has the extension ".lpj". Again, the file was saved with a simple name, without spaces and in a folder with a simple path to reach.

In general, Lisrel defines variables, parameters and commands with two letter codes, as shown below:

[2] A second alternative for the preparation of the data, practicable in the case in which the model to be estimated includes a few variables observed (e.g. , < 12), is to write eventually the matrix of the variance-covariances between these variables in the Lisrel syntax. In this case, although it is not necessary to create a data file, it is not possible to test the assumption of multivariate normality. It is possible, in fact, to calculate the matrix of variance-covariances between the variables observed using SPSS, Excel, or Lisrel. Then, you can write or copy the data in the Lisrel syntax with the following command: "CM SY" or "CM FU".

Table 15: Lisrel notation

Matrix	Elements	Code
Λ^x	λ^x	LX
Λ^y	λ^y	LY
Θ^δ	ϑ^δ	TD
Θ^ε	ϑ^ε	TE
Γ	γ	GA
B	β	BE
Φ	φ	PH
Ψ	ψ	PS

Source: *Authors' elaboration*

Subsequently, all elements of the matrices were defined according to the formulation of the model to be estimated. To this end, Lisrel allows you to use some default matrix shapes and configurations:

Table 16: Forms and configurations of the model matrices

Matrix	Code	Shape	Configuration
Λ^x	LX	FU	FI
Λ^y	LY	FU	FI
Θ^δ	TD	DI	FR
Θ^ε	TE	DI	FR
Γ	GA	FU	FR
B	BE	ZE	FI
Φ	PH	SY	FR
Ψ	PS	DI	FR

Source: *Authors' elaboration*

As far as syntax writing is concerned, the title has been indicated in the first line; it is an absolutely "free" line that serves as a reminder. Subsequently, the line was executed by adding the data indications, whose initial command is "FROM". This command contains information on the number of observations ('No'), the number of variables observed ('NI') and the type of matrix used ('MA'). Each of these commands was followed by the sign "=" and the value adopted by the model (e.g.: CFA on relational constructs - from no=150 ni=16 ma=cm).

Subsequently, the "LA" command was executed, which indicates the labels of the variables; afterwards, the labels of the observed variables were written in a line, separated by a space[3].

At this point, to insert the data, the location of the file containing the data has been indicated. There are several methods for executing this command. In this case, having previously created a ".psf" file, we used the "RA" command, which indicates "Raw Data", and the "FI" command which, only in the data indication commands, indicates "file" (e.g.: CFA on relational constructs - from no=150 ni=16 ma=cm - ra fi=c:\gennaro.psf)[4].

The sign "=" is followed by the indication of the form ("FU" for "Full", "SY" for "Symmetrical", "DI" for "Diagonal", "ZE" for "Zero", "ID" for "Identity" and then the indication of the general configuration of the matrix: "FI" for "Fixed" or "FR" for "free" (e.g.: mo ne=2 nk=2 ny=8 nx=8 ly=fu,fi lx=fu,fi be=fu,fi ga=fu,fi ph=sy,fr ps=di,fr te=di,fr td=di,fr).

For convenience, the matrices LY, LX, BE and GA have been set to "FU,FI", and then insert in the following lines the commands relating only to the parameters of the same to be estimated.

The PH matrix has been set as "DI" to specify a measurement pattern with embedded latent variables[5]; the PH matrix has been specified as "FI". (fixed) and,

[3] If you use a ".psf" file, Lisrel still reads the labels of the variables included in the data file, making the LA command redundant - e.g.: CFA on relational constructs - from no=150 ni=16 ma=cm - la - y1 y2 y3 (...) y8 x1 x2 x3 (...) x8).

[4] If, instead, you decide to paste the matrix of variances-covariances between the variables observed in the Lisrel syntax, you can use the "CM" command, which indicates "Covariance Matrix", followed by the indication of the form of such matrix: "FU" (Full) or "SY" (Symmetrical); after which, you paste (or write), at the end, the data matrix.

[5] The PH matrix must be set to "SY" only if you want to specify a measurement model with related latent variables.

therefore, in the following lines the commands relative to the relative parameters to be estimated (free) have been indicated[6].

The PS, TE and TD matrices, as typically happens, have been fixed as "DI,FR"; in particular, the TE and TD matrices foresee correlated errors, unless there are important theoretical reasons that can support the hypothesis of correlated errors (but that could reduce the theoretical consistency of the specified model).

The PS matrix could only be specified as "SY" if there is an interest in estimating equations with multiple correlated dependent variables.

Based on the specification of the matrices, the parameters to be estimated ("FR"), fixed at zero ("FI") or fixed at a certain value ("VA ≠") were subsequently defined. An example is given below:

…

mo ne=2 nk=2 ny=8 nx=8 ly=fu,di lx=fu,fi be=fu,fi ga=fu,fi ph=sy,fr ps=di,fr te=di,fr td=di,fr

fr ly(2,1) ly(3,1) ly(4,1) ly(6,2) ly(7,2) ly(8,2)

fr lx(1,1) lx(2,1) lx(3,1) lx(4,1) lx(5,1) lx(6,2) lx(7,2) lx(8,2)

va 1 ly(1,1) ly(5,2) ph(1,1) ph(2,2)

…

[6] If the matrix had been set as "FR", in the following lines the parameters to be fixed would have been set to zero (fixed).

Then, the labels of the latent variables were defined with the commands "LE" (Label Eta) and "LK" (Label Ksi); for this purpose, after having inserted, one at a time, these commands, the labels separated by a space are inserted at the end.

In addition, it has been requested, through the command "PD", the inclusion in the output of the path diagram of the model:

Finally, you had to enter the "OU" (Output) command for:

- specify the desired output;
- the estimation method (default =ML);
- the number of decimals ('ND');
- the possible exclusion of the eligibility test ('ad=off').

For your convenience, some of the other commands used to process data with Lisrel are shown in the following table:

Table 17: Some commands used to process data with Lisrel

Commands	**Syntax procedures**
"CO" (constrained): to define the value of a parameter as a function of other	… co td(1.1) = .1*Lx(1,1) …
"EQ" (equate): to fix the values of two or more parameters equal to each other	…

	eq ly (1,1) ly (2,1) …
"ST" (starting values): to set the initial values of the parameters for the iterations (default from 2SLS)	… st all .50 …

Source: *Authors' elaboration*

In some cases, standardised residues, change indices and standardised expected changes may suggest that the estimated model should be respecified. However, re-specification only makes sense if there are well-founded theoretical reasons for estimating the re-specified model.

Moreover, it is important to stress that Lisrel's diagnostics should not be used to achieve post-hoc fit improvement, as SEMs are a confirmatory and non-exploratory technique.

In the next paragraph, we highlight the results obtained by testing a Structural Equation Models using data collected with reference to the perceived quality of public service, the analysis of which is traditionally characterized by high interpretative complexity.

4.2 Findings

After elaborating the data, a Principal Components Analysis (PCA) was conducted to identify the factors best able to explain the chosen constructs.

Next, following the indications of Tavakol and Dennick (2011), Tabachnick and Fidell (2012), and Pett et al.(2003), an iterative process was carried out to verify the validity and reliability of each scale of items obtained after the PCA. Table 18 summarizes the values obtained at the end of the iterative process, highlighting that all of the minimum thresholds of acceptability were exceeded with regard to the KMO Test, the Bartlett sphericity test, the total explained variance of the analyzed phenomenon, and Cronbach's Alpha:

Table 18: Validity and reliability of the measurement scales

Variable	Scale Validity			Reliability Scales
	KMO Test	**Bartlett Sphericity (sign.)**	**Total Explained Variance**	**Cronbach's Alpha**
Transparency	0.792	0.000	69.231	0.874
Citizen participation	0.916	0.000	77.453	0.826
Citizen collaboration	0.856	0.000	76.855	0.935
Perceived service quality	0.891	0.000	78.347	0.849

Source: *Authors' elaboration*

After verifying the validity and reliability of each scale of items, a structural equation model (SEM) was developed to test the simultaneous existence of causal relationships between the considered variables. In particular, the maximum likelihood method was used for the model estimation. Its adaptation goodness, as shown in Table 19, was measured by taking into account the minimum acceptability thresholds of several indices: the ratio between Chi-square and degrees of freedom (X2/df); Incremental Fit Index (IFI); Root Mean Square Error of Approximation (RMSEA); Comparative Fit Index (CFI); and Root Mean Residual (RMR).

Table 19: Absolute and incremental fit indices

Fit index	Value
X2/df	2.469
IFI	0.988
RMSEA = $\sqrt{\frac{(X^2-df)}{df(N-1)}}$	0.03
CFI = 1 - - $\frac{\tau_k}{\tau}$	0.976
StdRMR = [2 Σi ΣJ $[\frac{(Sij-\sigma(ij)^2}{k\,(k+1)}]^{1/2}$	0.05

Source: *Authors' elaboration*

Starting from the early checks carried out, each scale of items was valid, as shown in table. The fact that the scales were valid means that they were proven to adequately and exhaustively represent the investigated phenomenon. In fact, the findings demonstrated the overcoming of the KMO, highlighting an acceptable deviation between the observed and partial correlations with a good overall sample adequacy. This consideration was justified by Crane et al. (1991), according to which, values higher than 0.60 suggested that the factor analysis of the variable was adequate. In accordance with what was written by Tabachnick and Fidell (2007), since the significance of all scales was less than 0.005, the Bartlett Test was also overcome, emphasizing a high homoscedasticity, understood as homogeneity of the variance of the aleatory variables with a normal distribution. Moreover, the validity of the scales was also demonstrated by the fact that each of them presented a total explained variance greater than 0.50, which was in line with that stated by Pett et al. (2003).

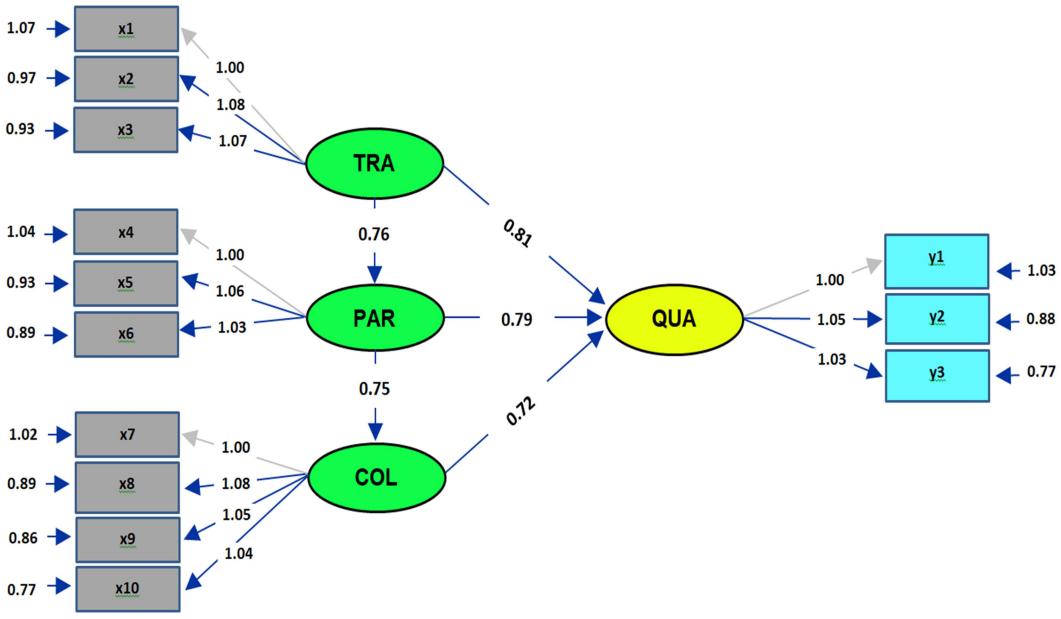
In addition to being valid, all the scales of items were also reliable since they showed a high degree of internal consistency with Cronbach's Alpha values greater than 0.70 (2012). Subsequently, as shown in Table 19, the fit of the model was evaluated. To this end, more indices were considered. In particular, the authors considered the ratio between Chi-square and degrees of freedom, which should range from 1 to 3 as suggested by Corbetta (1992).

Similarly, the RMSEA, which avoids errors due to the size of the sample by taking into account the discrepancy of the hypothesized model, with optimally selected parameter estimates and the population covariance matrix, was satisfied with a value lower than 0.06 (Brown, 2014). In line with the arguments put forward by Hu and Bentler (1999), one of the main indices capable of testing the fit of a SEM is the CFI, which examines the discrepancy between the data and the hypothesized model overcoming the problems related

to the sample size. The CFI was adequate since its value was higher than 0.95. The last index considered was the StdRMR, which measures the discrepancy between the sample covariance and the model covariance matrix. As its value was lower than 0.08, it can be considered as a good adaptation index of the model.

The graphical representation shown in Figure 12, relating to the estimated SEM, shows a high relational intensity between the variables, demonstrating the solidity of the tested path model.

Figure 12: The estimated SEM path model



Source: *Authors' elaboration*

Finally, Table 12 summarizes the results related to the hypotheses of the model tested.

Table 12: The results related to the hypotheses of the SEM tested.

Hypothesis	Result
H_1: *Transparency of Public administrations' activities affects perceived service quality.*	✓ Verified
H_2: *Transparency of Public administrations' activities affects citizens' participation.*	✓ Verified
H_3: *Citizens' participation in Public administrations' activities affects perceived service quality.*	✓ Verified
H_4: *Citizens' participation in Public administrations' activities affects their collaboration.*	✓ Verified
H_5: *Citizens' collaboration to Public administrations' activities affects perceived service quality.*	✓ Verified

Source: *Authors' elaboration*

4.3 Results discussion

The findings highlight the existence of some crucial aspects, sometimes undervalued within the PA, which should be taken into account for the proper management of Public administrations according to the logic of the Open Government Data, especially in a historical moment characterized by an increasingly felt need to manage huge amounts of data in a transparent, participatory and collaborative way.

In particular, according to the results of the analysis, it emerges that transparency of Public administrations' activities affects perceived service quality (H1). This underlines the great importance that citizens attach to the choices of Public administrations to make known what they have done or intend to do in the future, with regard to the organizational structure, opportunities for the community, notices, processes and, more generally, the activities that characterize the ordinary and extraordinary administration of the PA.

Moreover, as confirmed by the results of the analysis, it seems that citizens are encouraged to take an active part in the life of public bodies that adopt a behaviour devoted to transparency (H2). This means that, in order to stimulate citizens' involvement in public affairs, PA bodies need to ensure full accessibility of information concerning their own organisation and PA activities, so as to encourage widespread forms of democratic control over the pursuit of institutional functions and the use of common resources. In other words, in order for citizens to feel fully involved and, consequently, to have a positive perception of the quality of the public service used (H3), it is necessary to ensure effective knowledge of the action of the PA, encouraging the dissemination and accessibility of data and public documents on institutional sites, unless the law expressly excludes it (for example, for reasons of public security). This leader aims to foster the relationship of trust between citizens and PA and to promote the principle of legality (and prevention of corruption): all citizens have the right to request and obtain that PA publish acts, documents and information that they hold and that, for any reason, have not yet disclosed. To this end, it is necessary, however, that all data formed or processed by public bodies are intact, i.e. published in such a way as to ensure that the document is kept without manipulation or counterfeiting; they must also be up to date and complete, easy to consult, must indicate the source and be reusable (without limits of copyright or patent).

For a positive perception of the quality of public service by citadines-users, it may be useful, for example, to create a special section "Transparent administration", in which to enter all data relating to processes and public activities (curricula, salaries, management positions, calls for tenders, etc..), possibly according to a plan that establishes short and long-term objectives (performance to be achieved, prevention of corruption, promotion of the integrity of officials and other employees of the PA, etc.).

According to the results of the data analysis, the participation of citizens is one of the key elements of the multi-stakeholder collaboration of the PA (H4), positively impacting on the perception of the quality of the service provided by public bodies to the community of reference (local, provincial, regional, national or supranational). This aspect suggests that, in addition to citizen participation, it is necessary to encourage communication with all other stakeholders, i.e. with any other subject, public or private, directly or indirectly interested in the life of the PA (Ministries, National Anti-Corruption Authorities and for the evaluation and transparency of Public administrations, municipalities, associations, suppliers, families, individual citizens, etc.).

4.4 Implications: theoretical advancement and managerial insights

Based on the findings emerged and discussed above, the work provides both theoretical and managerial implications.

From a purely theoretical point of view, the thesis offers its contribution under a twofold profile: methodological and conceptual. Regarding the first aspect, the study brings to light the results obtained by testing a SEM, which represents a

methodology particularly appreciated for the analysis of data in the social sciences (Hair et al., 2016; Kline, 2015), especially since it allows verifying the interrelations between latent (not directly measurable) variables (Heck and Thomas, 2015; Duncan, 2014).

The Models of Structural Equations, in fact, not only represent a suitable methodology to analyze models, both simple and difficult to deal with, but also allow you to enjoy a number of advantages expressed in the possibility of carrying out operations otherwise not feasible (Schumacker, 2017; Keith, 2014; Byrne, 2013). In fact, the variables of theoretical interest in the social sciences are often latent, i.e. abstract concepts not directly observable, the measurement of which, as extensively discussed in chapter 3, can only take place indirectly, through observable variables affected by measurement errors, which represent empirical imperfect indicators, i.e. measures consisting of observed scores and subject to errors in observations. This aspect suggests the importance of using SEMs in surveys to be carried out in the public sector, which, as suggested by many authors (McAdam et al., 2005; Torugsa and Arundel, 2016; Mayne, 2017; Koppenjan and Klijn, 2015; Haynes, 2015; De Vries et al., 2016) represents a context characterized by considerable and increasing complexity.

Under the conceptual profile, the thesis favors the enrichment of the literature through the analysis of an approach to company management in a sector in which the studies in this regard are still fragmented.

Regarding managerial implications, the identification of the most incisive aspects in managing Public Administration according to the Open Government Data provides policy makers and public sector executives with valuable information for the development of policies and strategies capable of improving the quality of the service rendered to citizens (Shadbolt et al., 2012; Janssen, 2011; Bates, 2014; Jetzek et al., 2014) In particular, the usefulness of the thesis should be seen in the

fact that, through an empirical analysis, the work offers ideas to optimize the allocation of human, economic, technological and temporal resources. In other words, in presence of limited resources, as traditionally occurs in the public sector, knowing the aspects toward which investment should be opportunely directed could generate a considerable advantage for public domain services' recipients (Böhm et al., 2012; Geiger and von Lucke, 2011).

This consideration leads managers and policymakers to reflect on the need to encourage the dissemination of data-driven culture at every level of society so that citizens can take advantage of the benefits deriving from a thoughtful adoption of the OGD in the PA (Wang and Lo, 2016; Parycek et al., 2014). In this sense, the Open Government Data, thanks to the transparent dynamics of participatory and collaborative networks, as well as to the development of applications and technologies that allow the best exploitation of the data and information that are generated in the performance of the ordinary and extraordinary management of institutions, becomes a driving force for economic and social development (Kucera and Chlapek, 2014).

In this regard, underlining the positive effects generated by a management of PA according to the dictates of the OGD puts the public decision-maker in the role of facilitator and guarantor of the process of growth, innovation and continuous improvement (Jetzek et al., 2012), and not only as a provider of public services to the community.

Concretely, ensuring compliance with the principles of the OGD - transparency, participation and collaboration - allows citizens to interact more effectively and efficiently with their environment and make informed decisions, using, for example, information on transport, health, education, etc.. (Yu and Robinson 2012, Gigler et al., 2011).

In this regard, the work seeks to offer its contribution in terms of implications for both academicians and practitioners, highlighting why public organizations should adopt strategies inspired by the Open Government Data by means of a full involvement of citizens, who, in this perspective, becomes a co-creator.

Based on what stated above, the thesis could be considered useful to academics, since it attempts to foster a greater awareness about the benefits, risks, opportunities and treats arising from the use of one of the most innovative and alternative PA management systems, especially in consideration of the fact that, to date, the capacity of employing advantageously data represents the key of success of any kind of public administrations: collecting, analyzing and managing a large amount of open data provides additional information useful for public bodies. This consideration emphasizes the growing interest of public policy in open data management: today's society revolves around data, considered "an essential resource for economic growth, job creation and the progress of society in general" (https://ec.europa.eu/digital-single-market/en/policies/building-european-data-economy) and, consequently, of the Public Administration, one of the largest producers and holders of data of interest to citizens. For this reason, the philosophy of the OGD has been gaining ground for some time now and is developing around the world, an approach that invites all Public Administrations to release data so that they can be freely used, reused and redistributed by anyone interested.

This issue represents a real challenge for all industrialized countries in the world, including Italy, which in recent years has invested significant resources for social, economic and political growth through the implementation of the 3 guiding principles of the OGD. Thanks to this growth, Italy is positioned in the European panorama among the "Trendsetters", that is, among those who "have implemented an advanced Open Data policy with extensive portal functionality and national coordination mechanisms between domains".

Thanks to this important result is the strong incentive of the central bodies. The theme is in fact included in the Three-Year Plan for information in the Pa under two different aspects:

- PA data, together with the enabling platforms (SPID, ANPR, PagoPA) are considered the intangible infrastructures on which the entire ecosystem of PA digital services is based;
- the DAF (Data & Analytics Framework), has been identified as a key project of the Italian digital strategy.

The Regions are also playing an important role in this context. The first analysis of the eGovernment Observatory shows that Molise and Calabria do not have a proprietary data portal but rely on Sciamlab, Valle d'Aosta and Liguria have a section dedicated to Open Data within their institutional portal, while all the other Regions have a dedicated Open Data portal. In total there are more than 18,000 datasets published on the regional portals. However, there are still major differences within the country. In fact, more than 70% of these datasets are published by Regions of Northern Italy. In this positive and growing context, there is a great challenge to which the Italian Public Administration is called: that of "downloading" innovation, i.e. involving local authorities, up to the smallest ones in this process.

Local Authorities and, in particular, Municipalities play a role of primary importance: a substantial part of the data of interest are, in fact, held by Municipalities (think, for example, of data on public transport, tourism, culture and productive activities) and consequently it is necessary for the latter to be involved, to participate from the very beginning and to have adequate resources to make the data usable in an open format.

In view of the overall improvement of the management models of the public administrations, the thesis highlights the attitude of the OGD to correct at a global

level the democratic systems by virtue of the idea that those who are called to administer public affairs must do so in an open way, giving citizens not only the necessary elements to evaluate the action taken and the policies adopted by the public body of reference, but also the possibility to actively contribute to the definition of strategies appropriate to the needs that evolve. Thanks to the OGD, citizens have the role of interlocutor with the role of protagonist with whom to interact in a logic of mutual exchange to ensure the satisfaction of the entire community.

To this end, Open Data must be understood as a central element in e-Government strategies, fundamental to foster greater transparency in administrative action (thanks to which responsibility is promoted, providing citizens with information on the activities of the public administration) and the active participation of citizens in the decision-making processes of public administrations (to make public data available to stakeholders - citizens, families, bodies, businesses -) online, with a constant increase in datasets exposed.

The actions undertaken in the context of policies aimed at encouraging the implementation of the OGD must, however, fit into a broader context of reform of the country's administration, with concrete actions on the front of transparency, collaboration and participation, in order to stimulate change in the relationship between citizens and administration, allowing people to interact with the PA in a simpler and easier way. This is a fundamental and particularly delicate step in the implementation of the digitization of the Country.

Conclusion

The results emerged from the survey allow corroborating the idea according to which transparency, participation and collaboration are three indivisible pillars of the OGD, able to influence each other according to a logic that places the citizen at the center of the Public Administration management. Moreover, the OGD, as a whole, emerges as an approach capable of significantly conditioning the perception of citizens-users of public services provided by institutions, to the point of representing a possible solution for the improvement of the important relationship between PA and territory.

The citizens' involvement in the institutions management facilitates the public policies harmonization, contributing to a more adequate definition of the short and long-term objectives and a more appropriate implementation of the related strategies, even though the responsibility for the final decision remains in the hands of the administration governance.

Therefore, the attention to citizens and to their complex and changing needs represents an essential function to be able to implement a management model capable of determining an overall improvement in the perception of the quality of service provided by public bodies.

Thus, transparency, participation and collaboration, intended as key strategic levers to retrain relations between citizens and institutions, should emerge as the focus of the policies of many countries in the world, both EU and non-EU.

In this regard, in Italy, the Department of Public Function promotes the so-called "Method of civic evaluation", focused on an analysis process of the services provided by the PA from the point of view of the citizen. In collaboration with “Cittadinanzattiva”, a civic evaluation path and methodology of "urban quality" have been implemented, with which citizens, in partnership with the administrations, have directly assessed the quality of some services, acting not only as a data source but also as subjects capable of producing worth information and motivated judgments.

Increasing the citizens’ involvement in decisions in order to broaden the consensus and legitimacy of public action, reducing conflicts, is a strategy that many administrations are going to adopt by means of the introduction of e-democracy initiatives. The term e-democracy, in fact, means the citizens’ participation in the activities of local public administrations and their decision-making processes through the use of new communication technologies.

The innovative use of ICT allows for the opening of new spaces for dialogue among citizens and administration that integrate and reinforce traditional forms of participation: information, communication and active participation provide the

administration with a better basis for formulating public policies, ensuring a more effective implementation of decisions.

The involvement of citizens in the various phases of the life cycle of policies can be an important resource to gather from the civil society more information and alternative solutions, as well as to anticipate unexpressed needs through the classic channels of representative democracy.

New technologies are a valuable support tool to provide citizens with all the information necessary for an informed participation (information level), to activate dialogue mechanisms (consultation level) and to reach the formulation of shared decisions (level of active participation).

Therefore, pursuing transparency, participation and collaboration, it is possible to enhance the effectiveness of public policies, increase trust in administrations, contribute to strengthen democracy and, consequently, improve the perception of the public service quality.

This consideration is also supported from a regulatory point of view and, in fact, the reform of Title V of the Italian Constitution introduces, in the art. 118, the "principle of horizontal subsidiarity", which states that "State, Regions, Metropolitan Cities, Provinces and Municipalities favor the autonomous initiative of citizens, individuals and associates, for carrying out activities of general interest, based on the principle of subsidiarity ". This means inducing a further

evolution of the modes of relationship among Public Administration and citizens, giving to the latter a role of primary centrality in public life, as well as a new power of initiative, according to a logic of transparency, participation and collaboration.

In line with this conceptual approach, the role of the Public Administration changes too: it is no longer only a service provider but a subject able to catalyze, manage and make contributions of different nature, in an optics of co-thinking, co-planning and co-building policies.

However, from many points of view, the OGD still remains an unexplored territory, given that a large part of its potential does not seem to have been adequately exploited (Ubaldi, 2013). For this reason, for a public administration, communicating is increasingly a challenge, especially whether aimed at activating processes of comparison and relationship with citizens, enabling them to reach higher levels of awareness and knowledge of structure, actions and processes of institutions.

Therefore, public administrations need a strong predisposition to dialogue with their community in order to encourage the participation of different stakeholders in defining strategies and programs: the PA should be able to govern relations by reformulating their own decision-making processes based on relationship systems broader and more complex than the traditional ones.

In the light of what has been described so far, this thesis takes part in the set of all those studies that support the OGD as an appropriate management and governance model for public administrations able to respond effectively and efficiently to the changing citizens' needs. In particular, in an attempt to contribute to the enrichment of knowledge about the Open Government Data as a management and governance approach for the PA, the work provides an empirical evidence of the advantages deriving from the adoption of its pivotal principles: transparency, participation and collaboration.

Following a wide examination of the most common ways of conducting organizations employed in the PA over the years, in this work ample space has been devoted to the deepening of the OGD, especially by virtue of its adherence to the contingencies of the contemporary historical context and, hence, to its suitability to represent a valid solution to the inefficiency and inefficiency that, unfortunately, very often characterizes the choices and public policies.

The use of Structural Equation Models has allowed testing some hypotheses about the interaction between the three dimensions of the OGD, as well as to verify to what extent this approach affects the citizens' perception of the public service quality. The use of this quantitative research methodology has requested the administration of questionnaires. This choice, if on the one hand has allowed building a large sample (made up of over 350 citizens), on the other hand has reduced the depth of the analysis, since it has prevented from investigating with

high degree of detail the thought of citizens involved in the sample survey. For this reason, the thesis could be considered as a starting point for a future research project to be carried out by using additional qualitative and quantitative techniques, to be applied by means of both traditional (such as interviews, focus group, etc.) and innovative (such as social media analytics, cognitive computing, big data analysis, artificial intelligence) techniques.

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