Profile of the public administrator in Colombia: a perspective from industry 4.0 And the social appropriation of knowledge

Perfil del administrador público en Colombia: una mirada desde la industria 4.0 y la apropiación social del conocimiento *

Perfil do administrador público na Colômbia: uma visão da indústria 4.0 E a apropriação social do conhecimento

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Abstract

Introduction: Restructuring aspects within public organizations, one of them was the issue of professionalization of public service, although this was initially considered for high bureaucracy, as a starting point for managerial reform. Objective: The purpose of the article is to reflect on the relationship of the profile of the public administrator in Colombia from the social appropriation of knowledge and the challenges that industry 4.0 implies. Reflection: Both for industry 4.0 and the social appropriation of knowledge, the profile of the Public Administrator is based on research and technological development and innovation in the organization and management of the State, citizenship and construction of the public. Conclusions: they correspond to the challenges of the profile of the professional in Public Administration, which should clearly warn the commitment of what it means to be located in the orientation of the methods and/or methodologies of the research focused on the appropriation of knowledge and the use of the technologies related to industry 4.0 that should lead to innovative products and services.

Keywords: Public Administration; Knowledge Management; Social Appropriation Of Knowledge; Industry 4.0.

Resumen

Introducción: Reestructurar aspectos al interior de las organizaciones públicas, uno de ellos fue el tema de la profesionalización del servicio público, aunque éste inicialmente se planteaba para alta burocracia, como punto de partida de la reforma gerencial. **Objetivo:** El propósito del artículo es reflexionar sobre el relacionamiento del perfil del administrador público en Colombia desde la apropiación social del conocimiento y los retos que implica la industria 4.0. **Reflexión:** Tanto para la industria 4.0 como la apropiación social del conocimiento el perfil del Administrador Público se sustenta en investigación y desarrollo tecnológico e innovación en la organización y gerencia del Estado, ciudadanía y construcción de lo público. **Conclusiones:** corresponden a los retos del perfil del profesional en Administración Pública, el cual debe advertirse claramente la apuesta de lo que implica ubicarse en la orientación de los métodos y/o metodologías de la investigación enfocado hacia a la apropiación del conocimiento y el uso de las tecnologías relacionadas con la industria 4.0 que deben conducir a productos y servicios innovadores.

Palabras Clave: Administración Pública; Gestión Del Conocimiento; Apropiación Social Del Conocimiento; Industria 4.0.

Resumo

Introdução: Aspectos de reestruturação nas organizações públicas, um deles foi a questão da profissionalização do serviço público, embora esta tenha sido inicialmente proposta para uma elevada burocracia, como ponto de partida para uma reforma de gestão. Objetivo: O objetivo do artigo é reflectir sobre a relação entre o perfil do administrador público na Colômbia a partir da apropriação social do conhecimento e os desafios colocados pela Indústria 4.0. Reflexão: Tanto para a Indústria 4.0 como para a apropriação social do conhecimento, o perfil do administrador público baseia-se na investigação e desenvolvimento tecnológico e na inovação na organização e gestão do Estado, na cidadania e na construção da esfera pública. Conclusões: estas correspondem aos desafios do perfil do profissional na Administração Pública, que deve ser claramente visto como um compromisso com o que está implícito na orientação de métodos e/ou metodologias de investigação centradas na apropriação de conhecimentos e na utilização de tecnologias relacionadas com a Indústria 4.0 que devem conduzir a produtos e serviços inovadores. *Palavras-chave:* Administração Pública; Gestão Do Conhecimento; Apropriação Social Do Conhecimento; Indústria 4.0.

71

PENSAMIENTO AMERICANO

INTRODUCTION

Contemporary governments enthusiastically adopted the idea of reinventing themselves, which implies a change from traditional bureaucratic management of the public service to a more entrepreneurial one (Osborne and Gaebler, 1992). This change implied reviewing and restructuring aspects within public organizations, one of which was the professionalization of the public service, although this was initially proposed for the senior bureaucracy as a starting point for managerial reform (CLAD, 1999), and later became an aspect that began to be considered for all levels of public employment. In this sense, the professional profile of the people who carry out activities in the public administration would begin to be a relevant aspect because their competencies and skills directly influence the achievement of government results.

Therefore, the training of the individuals who would carry out public functions would begin to be the subject of greater interest, since this aspect had long been considered fundamental, an example of which is the creation of specific training units for the public sector, such as the National School of Administration (ENA) in France, the National Institute of Public Administration (INAP) in Mexico and, in the Colombian context, the Higher School of Public Administration (ESAP). It is important to bear in mind that, in the public service, there are various professionals who each contribute a specific area of training, but there are also public administrators who are trained specifically in public knowledge and practice. For this reason, this article will analyze the public administrator by profession and will propose an analysis of his professional profile in the current context in the case of Colombia.

Public administrators can develop their role from different fields of action of public administration and at different levels. Angiola and Bianchi (2015) mention that public administrators should be understood in a broad sense, referring to political figures, such as the president, governors, mayors, etc., as well as to administrative figures, i.e. management employees, senior managers, middle managers, etc. Within the administrative framework required to operate a public organization are also those professionals who carry out support, supervisory and technical activities.

Given the multiple roles and levels where a public administrator could exercise and contribute to the development of the territories, this document presents the result of a documentary review on the profile of the public administrator required by current public organizations in the context of Colombia. For this purpose, some general aspects related to the competencies and skills that a Public Administrator should develop are taken up again, but the emphasis is made on two fundamental aspects that are current and that the authors consider as fundamental to adapt governments to the changes that occur in the context, these are related to: Industry 4.0 technologies and their impact on the processes of public administration; and secondly, the role of the public administrator as an actor for the social appropriation of knowledge, from which public innovation can be promoted for the transformation of the territories. These ideas are developed in greater depth below.

Considering that the intention is to identify the changes in the configuration of the professional profile of the Public Administrator in the current context in Colombia, it is appropriate to mention that the pro-

PENSAMIENTO
AMERICANO

The training process in a Higher Education Institution that offers the Public Administration program will be accompanied by two other missionary and complementary processes, namely, research and social projection, also known as outreach. The training process fosters the development of competencies and skills through the acquisition of knowledge and the simulation of the same in academic environments, on which the individual will later rely for professional practice. It is from this process that the development of competencies could be impacted, or at least the beginning of the intention, and it is here where, through an updated professional profile adjusted to the country and the territories, a greater impact could be had. This would also imply special attention to the global context of public administration, since trends somehow impact the local context.

From this point of view, it is necessary to consider, review and introduce new competencies or rethink existing ones to respond to the contemporary challenges of public administration, from emerging and consolidating currents, which is why the analysis is based on the interference of Industry 4.0 in public administration and therefore in the profile of the individual trained in this field of study. In a second moment, the social appropriation of knowledge is proposed as an edge of interest for the analysis, this because not only a public administrator is required, who is installed in a specific position and from there exercises the functions pre-established in a manual, but it is also important to highlight the role of the public administrator from an approach where he/she can develop public positions that may require more dynamic professionals, who can read the territorial and national problems, study them in depth (research), and serve as a bridge for the actors of society to understand the problems, generate knowledge and from there generate innovations that impact development from the social, economic, environmental and institutional dimensions.

With the above, it may be that the research and social projection processes have been developing for a long time, so it will be pertinent to continue strengthening them, but it is undoubtedly necessary to train the public administrator, who not only manages, researches and supports (through consultancy and technical assistance) territorial problems, In addition to these fundamental roles, it is also necessary for them to develop an additional one, which is to serve as a catalyst for the social appropriation of knowledge, through which problem-solving capabilities are generated, an aspect that is also in line with the participatory governance and open government approaches.

In the first part, the documentary review and analysis of categories of analysis in relation to the profile of the public administrator in Colombia is addressed; in the second part, the public administrator in Industry 4.0 and in the social appropriation of knowledge are considered; in the third part, the reflection and, in the last part, the conclusions are made.

THEORETICAL FRAMEWORK / FRAME OF REFERENCE

Public administration in the 21st century is undergoing dramatic changes (UNDP, 2015). In this sense, public organizations face challenges that lead them to evaluate their management capacity to meet the demands of their stakeholders, adding public value through an efficient use of resources (Jurado-Zambrano and Valencia, 2021). Over the last 20 years, the public sector has undergone significant changes, leading to a replacement of the traditional bureaucratic approach to a more managerial one (Vaitkevičius, 2018). Public organizations face a multitude of challenges that oblige them to

73

The goal is to do things better, smarter, faster and cheaper by having to innovate existing processes, policies, programs and products (Van der Wal and Demircioglu, 2020).

In this sense, governments around the world enthusiastically adopted the idea of reinventing themselves, which implies a shift from the traditional bureaucratic management of the public service to a more entrepreneurial one, called New Public Management (Osborne and Gaebler, 1992). The reforms promoted by New Public Management have led to important changes in the organization and management of the public sector and to improve management processes in order to boost organizational performance (Walker et al., 2011). In this sense, a variety of reforms and projects have been developed under the mantle of public sector modernization to achieve efficiency, effectiveness, economy and quality in service delivery (Sotirakou and Zeppou, 2004).

Pollitt and Bouckaert (2017) define four categories through which public adminis- tration has evolved, these are: weberian administration, new public management, neo-Weberian public administration and new public governance. Other approaches such as Post-NGP, public value (Moore et al., 1997) and intelligent governance. The following is a brief presentation of the main ideas surrounding these approaches.

New Public Management constitutes a private vision of the public (Guerrero, 2003). According to Barzelay (2003), NPM is a field of professional discussion about how to structure, manage and supervise government offices and the public sector as a whole. NPM proposes a renewed entrepreneurial essence within government, replacing the exhausted bureaucratic administration (Guerrero, 2019) or also called traditional administration, which, according to Stoker (2006) was largely based on a Weberian perception of the world.

For some years now, the concept of NPM has been taking on other nuances, including Criado et al. (2021), who mention that public management is facing a transition to Post-NGP. The so-called Post-PPM trend emerged as a reaction to the shortcomings of previous reforms, particularly with respect to the increased fragmentation and lack of control that resulted from the NPM (Donadelli et al., 2020). Finally, Brinkerhoff and Brinkerhoff, (2015) posit that Post-NGP is a reformulation of new public management that seeks to go beyond accountability measures to give citizens a "voice."

Public value on the other hand, according to Soe and Drechsler (2018) is a conceptual approach to analyze the organization and performance management of government, becoming one of the most important successor paradigms of New Public Management (NPM).

Finally, a paradigm that has been a target of analysis in the field of public administration has to do with smart governance. Ruhlandt (2018) defines smart governance as the procedural interaction between a diverse set of stakeholders, endowed with different roles and responsibilities, organized in various external and internal structures and organizations, driven and facilitated by technology and data, involving certain types of legislation, policies, and sharing arrangements, in order to achieve substantive outcomes for cities or procedural changes (or both).

Public administration is a discipline that is undergoing major changes due to the constant changes that have been taking place in the last few years.

The public administration of the present and the future must therefore rely on rigorous research and the use of different methodological approaches and research designs for its updating and continuous development. Therefore, the public administration of the present and future must rely on rigorous research and the use of different methodological approaches and research designs for its updating and continuous development. The modern public administrator needs to understand scientific discovery and incorporate it into decision making, which is a primary function of the administrator. This is true whether the public manager's responsibility is financial, production, human resources or marketing and is valid regardless of the level of the manager (Blanco-Peck, 2006, p.34).

Now, Public Administration has its historiographic discussion in the Open State (WB), the Useful State (IDB) and the Intelligent State, inscribed in paradigms such as Public Management, New Public Management and Post New Public Management [AGN1], which continues to explain this discipline from its bases, origins and positivism, a fact that in reality is being altered by the interest in materializing the scientific, methodical criteria of knowledge in this discipline.

Modern public administration has roots that define it as a discipline with its own identity. It was formed in the 18th century with the advent of civil society and the rule of law, after political revolutions destroyed the conditions and relationships that delayed the advent of modern structures that gave way to a life of areas of competence, specialties and roles to be fulfilled. At present, public administration is undergoing changes that point to the acceleration of events and facts that are the face of a stage in universal history, characterized by the revision of postulates and the reaffirmation of classical elements (Uvalle, 2009, p.74).

It has been scientific pluralism that has led the idea to understand that the problems of Public Administration or any other context of knowledge cannot be solved or considered only through its own formulations or principles, forcing it to recognize in other sciences or disciplines the possibility of improving their analysis, consultancies, research, field work or accompaniment to different organizations or entities that require not only a complete but also a scientific, complex and open training in science, technology and innovation, hand in hand with the social appropriation of knowledge, This necessarily implies having a Public Administrator with broad knowledge on these fronts, not only to solve the apparent lag in the evolution of the State, but also to solve difficulties, drawbacks or gaps in training that have prevented him/her from raising the level of application, thought and reasoning regarding the evolution of Public Administration, in order to train not only public administration scientists, but also graduates capable of evaluating, formulating and making proposals under a high level of knowledge in accordance with the topics considered.

The structural problem of public administrations around the world is an absolute lack of strategic identity. When reforms are proposed, they do not look much beyond the present and only diagnose the problems of the immediate past, and all the prescriptive measures proposed, whether or not they are part of an administrative reform, are very short-term in nature. It is clear that over the last 50 years public administrations have undergone many changes, but these have been very few in terms of drastically modifying their conceptual paradigm. Today's public systems are too similar to those of fifty or even one hundred years ago. Technology and society advance and transform themselves at a hare's pace and public administrations wander at a snail's pace, if not in the direction of the crab (with significant regressions) or are immobilized for years with the stability and anchorage of a mussel. Politicians, civil servants and government scholars are not only

75

PENSAMIENTO
AMERICANO

They are aware that they are driving such a complicated artifact that they either keep it stopped for fear of not knowing how to lead or they drive it slowly, with low beams and obsessed with looking only at the rearview mirror (Ramió, 2015, p.1).

It is the right time to take advantage of the approach made by the training in Public Administration in terms of the articulation of the bureaucratic approach with the cohesion with the citizen, through statistics, mathematics, programming and the positioning of the software applied to this discipline, is possible. It is to encourage an effort that has been there, but has not found a mechanism on which to build or be named, reference or field work to address the regional areas such as those of application of the discipline. In this sense, it is expected that a strong block of knowledge will emerge in exact areas such as those mentioned above, to the extent that a discipline is required that manages to empower itself from arithmetic and geometric training on a par with programming packages, from which in the area of public administration everything is to be done or endorsed to the extent that management is required to have an APT with the capacity to manage the State, rationalize decisions and the articulation with the citizen.

The change of administrative rationality from the bureaucratic approach to the new public management approach brings with it the need to enhance the efficiency of the State, government innovation and constant connection with the citizen. This taking into account that Weber's ideal type: bureaucracy, focused its work on the official, the generation of files that document the work of public administration (Weber, 1999) within a certain legal framework, a hierarchical structure in which functions to be performed by government institutions are established (Buen- hombre and Vanegas, 2017, p.1).

Now, the route of the Public Administration subscribes to the way in issues related to scientific, complex and science, technology and innovation methods, hand in hand with open innovation and the social appropriation of knowledge. Although the State has been a protagonist not only in adapting to change but also in leading this process from different conceptions or positions, this has not been the case for the Public Administration, which still remains constrained by the positivist conception.

In this order of ideas, public administration is a matter of competencies. The concept of competency was first introduced in the 1970s (Ni and Chen, 2016), being specifically situated in the epistemological reconstruction that follows the crisis of the human capital paradigm (Guerrero Serón, 1999), to refer to the particular set of skills and/or qualities that could be used by the discipline of psychology as better indicators of job performance than standard intelligence tests (McClelland, 1973). While the term competence can be defined as the ability to accomplish a task to a certain, often specifically defined, standard, in comparison, the more holistic terms competence means the underlying attributes of a person, such as knowledge, skills and attitudes necessary to meet the standards of competence (Hoffmann, 1999). In the Colombian public sector context, the regulatory framework has defined labor competencies as:

The ability of a person to perform, in different contexts and based on the requirements of quality and expected results in the public sector, the functions inherent to a job; ability that is determined by the knowledge, skills, abilities, values, attitudes and aptitudes that the public employee must possess and demonstrate (Decree 815, 2018).

76

PENSAMIENTO
AMERICANO

Hoffmann (1999), based on the literature, identified that competencies can be analyzed from three positions: (i) as observable performance, (ii) as a standard or quality of the person's result or performance, and (iii) as the underlying attributes of a person. More specifically, Hoffmann (1999) states: if competence means performance, then the justification for using the approach is to improve or somehow change human performance. When competence means standards or quality of performance, then the rationale is to standardize skills, raise standards, introduce changes or establish minimum standards of performance. When competence means the underlying attributes of individuals, then the rationale is to determine the curriculum or learning content that will lead to competent performance.

It could be said that in order to cover the purpose of this document, it would be necessary to resort to a combination of the above positions, since it is necessary to establish generic competencies for the current Public Administrator based on a reading of the context, then establish them as a possible point of reference, and finally, it is necessary for HEIs to introduce them in the professionalization programs in Public Administration, as well as in the training programs of public organizations. When applied in professional life, the concept of competence takes into account what a person is capable of doing in a work context, regardless of how this knowledge has been acquired (Hunnius and Schuppan, 2013).

It should also be taken into account that the study of competencies has also been introduced in the context of higher education, so it is essential to understand the concept in a general way. In this regard, the competency-oriented approach arises from the academic field linked to training and employment, based on the contributions of the economics and sociology of work and labor pedagogy (Guerrero Serón, 1999).

Types of competencies: Professional competencies can be: basic, i.e. those competencies common to all occupations and which are essential for entering the labor market; technical-professional, which are specific to a profession and are divided into technical, methodological, social and participative; transversal, which cut across the different branches or occupations of production and services, according to the different levels of professional achievement; and key, which are oriented towards the ability to apply skills and knowledge in an integrated manner in real work situations (Bunk, 1994).

Decree 815 of 2018 defines labor competencies for public employment in two: functional and behavioral. Functional competencies specify and detail what the employee must be able to do in order to perform the functions related to the position and the behavioral competencies will be understood taking into account the following elements: responsibility for personnel in charge, work skills and aptitudes, responsibility for decision making, initiative for innovation in management and the strategic value and impact of responsibility (Decree 815, 2018). In this regard, it can be observed that the functional competencies are directly related to the technical requirements of the functions to be developed and, for their part, the behavioral ones involve aspects of the person, which will be complementary to the functional ones. A public servant should combine both types of competencies in levels as required by the nature of the job.

77

PENSAMIENTO AMERICANO

REFLECTION

Documentary analysis was used to identify the competencies required for public administrators in the context of Industry 4.0 technologies and the social appropriation of knowledge. This analysis is a process through which the knowledge recorded in the documents is organized and represented, seeking in turn to analyze and synthesize the data contained in them by applying linguistic guidelines, through which the substantive content is extracted (Peña Vera and Pirela Morillo, 2007).

This section was developed as follows. First, concepts related to professional profile and labor competencies were reviewed in general terms. This is because, in relation to the former, what is sought is to propose a profile for the current public administrator in Colombia, so it was necessary to know what the concept refers to. Subsequently, some characteristics related to labor competencies were addressed in a general way, since a profile responds to a set of competencies. Next, a review was made of the competencies established in Colombian legislation for the development of public functions. Finally, it focuses on the analysis of competencies in the framework of the technologies of the 4.0 revolution and those necessary to promote the social appropriation of knowledge.

It is understood as the set of traits and capacities that, appropriately certified by those who have the legal competence to do so, allow someone to be recognized by society as "such a professional", being able to be entrusted with tasks for which he/she is supposed to be qualified and competent (Hawes and Corvalán, 2005). If this definition is transferred to the context of higher education institutions, it could be said that the professional profile would be related to the set of technical and human competencies that become the promise of value in relation to the individual who is trained and delivered to the labor market and society in general. This is why an adequate reading of the labor, social and economic context where the higher education institution operates, will allow adjusting the professional profiles and the professionals in formation and trained to have the tools to face the current and future challenges. The above is consistent with what was stated by UNESCO (1998) in its document World Declaration on Education in the 21st Century, which insists that higher education institutions must adapt professional training to current and future needs of society in order to face new challenges.

The professional profile has multiple purposes. In the first place, it becomes the letter of introduction with which institutions of higher education attract potential students, that is, it serves as a persuasive strategy that connects personal interests with an offer for training. Secondly, it allows the potential student to have clarity about specific aspects of the programs that at a given moment become his or her training options, that is to say, it has an orienting function. And, thirdly, it becomes an instrument that allows the actors in society to develop a perception of the type of person that, once they have had access to the training, will be given to society, i.e., it allows them to identify general distinguishing qualities. For the first aspect mentioned, the professional profile, by gathering this reading of the context, would allow higher education institutions to develop a curricular content that will become the training route that the student will follow to begin developing this set of competencies, which will subsequently allow him/her to transform his/her immediate environment while contributing to the construction of society.

PENSAMIENTO
AMERICANO

To this extent, the profile of the public administrator is inscribed in the Competencies of the public servant in Colombia. The strategic management of human talent is a policy, considered as the heart of the organizational architecture of public entities in Colombia, an aspect that began to be considered in such a way with the definition of the Integrated Model of Planning and Management, originated from the expedition of Decree 1499 of 2017, and developed through the Operational Manual of the same (Administrative Department of the Public Function, 2021a). One of the main purposes of the Colombian public administration is to build and consolidate an effective human talent management model that allows entities to have suitable and competent public servants (Departamento Administrativo de la Función Pública, 2021b). For this reason, efforts to professionalize the public administration have been progressively developed, although it can still be said that there is still a long way to go in this area. In order to have suitable public servants, it is necessary, among other aspects, to promote the development of labor competencies or to guarantee them at the time a person joins the public service, which is why the study of these competencies has been under continuous analysis.

From the regulatory point of view, the governing bodies in the area of labor competencies for the public sector in Colombia have been making adjustments to the subject aimed at contributing to the correct performance of activities in the public sector. Thus, Law 909 of 2004 began to regulate the need to manage competencies as a fundamental element for the development of public employment, given that it is understood as the "set of functions, tasks and responsibilities assigned to a person and the competencies required to carry them out, with the purpose of satisfying the fulfillment of the development plans and the purposes of the State" (Law 909, 2004). In the work of Fierro (2017) a general review of a set of regulations related to public employment in Colombia is evidenced, among which are: Decrees Law 770 and 785 of 2005, Decree 760 of 2005, Decree 1227 of 2005, Decree 1228 of 2005. In this regard, it is important to mention that, although the aforementioned set of regulations does not focus directly on the subject of labor competencies, they do partially develop the concept and its importance when considering the structuring of public employment and its characteristics. Recently, the regulations that define the functional competencies for transversal processes in public entities are found in Resolutions 667 of 2018 and 629 of 2018. Finally, Decree 815 of 2018, which amends Decree 1083 of 2015, establishes the competencies for each of the levels of public employment in Colombia, as well as a set of transversal competencies that will help consolidate public organizations that work efficiently and oriented towards adding public value.

Decree 815 of 2018 establishes that labor competencies will have within their components behavioral and functional competencies, which will be adjusted to each of the levels of public employment in Colombia, as follows:

PENSAMIENTO
AMERICANO

Diego Armando Jurado Zambrano, Gleidy Alexandra Urrego Estrada & Jahir Alexander Gutiérrez Ossa

Table 1.
Colombian public sector labor competencies.

Employment level	Behavioral competencies	Behavioral competencies cross-cutting
Assistance	Information management, interpersonal relations and co-operation	
Technician	Technical reliability, discipline, responsibility	
Professional	Technical-professional input, effective communication, procedural management, decision implementation. *If you have personnel in charge:* Personnel management and development, decision making	Continuous learning, results orientation, user and citizen orientation, commitment to the organization, teamwork and adaptation to change.
Advisor	Conflict resolution, creativity and innovation, initiati- va, relationship building and relationship building.	
Executive	Strategic vision, effective leadership, planning, decision making, people development management, systemic thinking, conflict resolution	

Source: : From Decree 815, 2015.

In addition to the functional competencies established in Decree 815 of 2018, there is a catalog annexed to Resolution 667 of 2018 (Departamento Administrativo de la Función Pública, 2018), which describes the competencies required for each of the processes that can be identified in a public organization, such as: financial management, internal control, procurement, human talent, technology, etc. Considering that this article seeks to identify a set of new competencies in technology, derived from the requirements of Industry 4.0, which should be adopted by organizations and incorporated by public servants, it was considered appropriate to describe the competencies that have been proposed for the Colombian public sector, as shown in Table 2.

Table 2.
Technological competencies by hierarchical level in Colombia.

| Technical- logical competencies by hierarchical level in Colombia Hierarchical level | Labor Competency Standards | |
	Function	Key activities
Professional	Identify opportunities for the adoption of new technologies in accordance with the trends of the environment and the needs of the entity. Establish the management scheme for IT projects and IT service providers, in accordance with the strategic planning of the entity. Manage technology services in accordance with the IT management model and the PETI. Manage the information security and privacy model, in accordance with current regulations.	Evaluate emerging technologies and/or IT trends. Define criteria for optimization and evaluation of IT investment alternatives. Manage IT projects. Specify the technical conditions of the IT services to be contracted with suppliers Guide the transition of technological and logical services To establish the guidelines for the operation o f technological services. Recognize the information security status of the organization Plan for information security risk management Carrying out the risk management plan
Manager, Advisor and Professional	Design the strategy for the use and appropriation of technologies of the entity in accordance with the organizational needs and culture and the PETI. To manage technological change in coordination with the related areas of the entity, in accordance with the needs of the entity and the sector.	Characterize stakeholders Establish incentives and training plan for stakeholders. Execute change management actions in IT projects. Measure the results of use and appropriation.

80

PENSAMIENTO AMERICANO

Technical- logical competencies by hierarchical level in Colombia	Labor Competency Standards	
Hierarchical level	Function	Key activities
Manager, Advisor and Professional	Formulate the strategic planning of information technologies, in accordance with the institutional and/or sectorial mission and guidelines established by the competent authority.	Elaborate a diagnosis of the current IT situation of the entity or sector. Design the IT strategy aligned with the institutional or sector mission. Determine the mechanism for monitoring compliance with the IT strategy.
Management, Advisor	Articulate the construction of the enterprise architecture based on established methodologies and the AE reference framework for the IT management of the Colombian government	Participate in the definition of the business architecture. Structuring the IT architecture. Organize the area structure and the IT management model. Structure IT policies or guidelines. Manage operational level agreements with areas or processes. Manage the risk associated with the delivery of IT services.
	Develop the IT governance processes in the entity's process map, in accordance with the regulatory framework and institutional priorities.	
Advisor, Professional	Determine technological solutions for management and analysis of in-training, according to the resources and needs of the entity.	Analyze the entity's information needs. To constitute information management and analysis tools. Define the information architecture Create information services.
	Manage quality information in accordance with the guidelines of the IT policy-making body and best practices.	Manage the information life cycle Identify information systems needs and requirements. Defining the architecture of the information systems
	Lead the development of information systems according to institutional needs and established guidelines.	Driving the lifecycle of the training systems Build the software components of information systems.
	Develop the information systems according to the established design and methodology.	Test the software components of information systems. Perform maintenance of information systems Provide technical and functional support to and information systems. Ensure the continuous improvement of technological services.
	Ensure the operation of the information systems based on the requirements of the entity and/or the sector.	Define the technological services architecture of the entity. Ensure the continuous improvement of technological services.
	Coordinate the evolution of the IT service architecture in accordance with the IT strategic plan.	Putting technological services into production. Provide support to the requests and requirements of the users of technological services.
	Operate technological services in accordance with the defined operating guidelines.	
Professional, Technical		

Source: Resolution 667, 2018.

The public administrator in Industry 4.0: Today there is an urgent need to understand the impact that technology is having on the workforce, an urgency that is given by the Industry 4.0 paradigm: a socio-technical revolution, which affects both human and technological resources (Fareri et al., 2020) and which impacts organizations of all sectors and sizes, so those belonging to the public sector have not been the exception. In addition, governments, for some time now, have been concerned about reducing the digital divide and turning the information and knowledge society into an opportunity for all and avoiding lags (Centro Latinoamericano de Administra- tion para el Desarrollo, 2007), in the same sense Criado (2021) states that the dissemination of information and communication technologies (ICT) in public administration is not a recent phenomenon in Latin American countries.

81

This has led to the fact that professionals working in the public sector need to update their professional competencies with the same speed of change, which will allow them to add value in the development of their functions. This is why, as a result of rapid technological changes, governments are trying to look to the future of the sectors that characterize the modern economy; likewise, universities are remodeling their offerings almost every year (Fareri et al., 2020). In this regard, the OECD and ILO (2018) state that new technological advances, along with globalization and major demographic shifts, are likely to bring about substantial changes in the skills needed for countries, companies and individuals to thrive. With the above context, one question that might arise is.

What are the competencies required in public organizations to face the changes resulting from the expansion of current technologies? To answer this question it is necessary to review the concepts of Industry 4.0. For this purpose, this article will focus specifically on the technologies known as Big Data and Artificial Intelligence, so that from here it will be possible to identify a set of competencies and skills that should be incorporated into the training processes, from the university curriculum, or from training, in training and strengthening processes in the workplace.

Although Industry 4.0 is currently a priority for many companies, research centers and universities, there is no generally accepted understanding of the term (Hermann et al., 2016). In the spirit of understanding a little more about the subject matter below are some specific characteristics and technologies that make up Industry 4.0. Lukac (2015) concludes that the principles of Industry 4.0 are interoperability, virtualization, decentralization, real-time capability, service orientation and modularity. Similarly, Roblek et al. (2016) points out that the five main characteristics of Industry 4.0 are: digitization, optimization and customization of production; automation and customization; human-machine interaction; value-added services and business; and automatic data exchange and communication. Lasi et al. (2014) and Roblek et al. (2016) argue that the communication of information, through different media (e.g., cyber-physical systems, Internet of Things and Internet of Services) is the key point of Industry 4.0, so it would have to do with knowledge management. Apart from the characteristics, the process of understanding the elements of Industry 4.0 also involves understanding a number of technologies that comprise it. Yang and Gu (2021) argue that Industry 4.0, had nine pillars when it was first announced, these were: cyber-physical systems, Internet of Things, Big Data, 3D printing, robotics, simulation, augmented reality, cloud computing and cyber security.

Industry 4.0 is introducing rapid and far-reaching changes and challenges, among these, in competencies and job profiles (Fareri et al., 2020). Digital competence has become a key concept in the discussion about what kind of skills and understanding citizens should have in the knowledge society (Van Laar et al., 2017). As presented before, the term "Industry 4.0" describes different changes, mainly driven by IT (Lasi et al., 2014), so the analysis of the competencies that would integrate the profile of the public administrator today is going to require a strong relationship with technology and its different forms of application, this logically from the roles that such a professional could have in public organizations and in the other structures where public administration comes to life. In order to study the differences in digital skills and develop interventions to improve them, several frameworks and definitions of skills have been introduced in recent years (e.g., 21st century skills, digital skills, digital competence, digital literacy, digital skills, Internet skills) (Van Laar et al., 2020).

82

The development of the global knowledge society and the rapid integration of ICTs make it imperative to acquire the digital skills necessary for employment and participation in society, while changes in the labor markets, skills such as information search and evaluation, problem solving, information exchange or the development of ideas in a digital context are perceived as essential (Van Laar et al., 2017). With the above, it can be mentioned that it is imminent and necessary to start considering the competencies that the current and future public administrator will have to strengthen, acquire or develop. These competencies should be focused on enhancing current competencies, such as strategic vision, negotiation skills and strong technical knowledge in public administration matters, but it is imperative that new approaches begin to be adopted, such as decision making based on data analysis, predictive models on public scenarios and problems, which must be supported by the adoption of technology.

The challenges associated with the adoption of new technologies not only imply that public administrators must be aware that this necessarily requires acquiring new competencies in areas such as universities, but also that they must visualize how new technologies will change the internal context of organizations, in relation, for example, to the optimization of processes and the agility required for them. In this sense, the competency model that adapts to future work scenarios in Industry 4.0 includes attitudes towards digitization and the handling of digital devices, information literacy, application of digital security standards, virtual collaboration, digital problem solving, as well as a demonstration of reflective judgment of one's own actions in an interconnected and digital environment (Roll and Ifenthaler, 2021). With the above, it could be said that the public administrator should not only be trained in the understanding and application of new technologies, but should also consider the need to think, from the organizational design, in transformations focused on improving processes and mechanisms of interaction with stakeholders.

The adoption and rethinking of the competencies of public administrators is undeniable, but in this regard it is also necessary to be cautious and the analysis should be slower and consider aspects specific to each region or country, since it is not the same to talk about technological development in a developed country as in an emerging one. If we add to this the fact that there is no single clear standard for the deployment of Industry 4.0, each country is implementing its own version, so there may be differences in their approaches due, for example, to the specialization of each market and industry, which may even lead to change the results of Industry 4.0 as we have predicted now (Yang and Gu, 2021). Second, the lack of bandwidth in most current network protocols could become the bottleneck that requires decades to improve (Wang et al., 2016). Third, many indus- trias have yet to ensure the quality and integrity of their recorded data (Yang and Gu, 2021), a case that also needs to be considered in the public sector. There is a lack of a standard approach to data entity annotations (Thoben et al., 2017).

This requires that the public administrator in the Colombian context consider multiple variables related to aspects of resources, geographic location, current technology, internal structure, professionalization of public employment, among others, which will make the adoption of new technologies and with it the development of competencies to face the transformation very particular.

83

Tabla 3.

Competencias requeridas en materia de tecnología

Autor/año	Áreas/competencias propuestas
Carretero et al. (2017)	*Área 1. Alfabetización en información y datos:* 1.1 Navegación, búsqueda, filtrado de datos, información y contenido digital; 1.2 Evaluación de datos, información y contenido digital; 1.3 Gestión de datos, información y contenido digital. *Área 2. Comunicación y colaboración:* 2.1 Interacción a través de tecnologías digitales; 2.2 Compartir a través de tecnologías digitales; 2.3 Compromiso con la ciudadanía a través de tecnologías digitales; 2.4 Colaborando a través de tecnologías digitales; 2.5 Netiqueta; 2.6 Gestión de la identidad digital. *Área 3. Creación de contenido digital:* 3.1 Desarrollo de contenido digital; 3.2 Integración y reelaboración de contenidos digitales; 3.3 Copyright y licencias; 3.4 Programación. *Área 4. Seguridad:* 4.1 Protección de dispositivos; 4.2 Protección de datos personales y privacidad; 4.3 Protección de la salud y el bienestar; 4.4 Protección del medio ambiente. *Área 5. Resolución de problemas:* 5.1 Resolución de problemas técnicos; 5.2 Identificación de necesidades y respuestas tecnológicas; 5.3 Uso creativo de tecnologías digitales; 5.4 Identificación de las brechas de competencia digital.
Van Laar et al. (2017) Van Laar et al. (2020)	Las habilidades digitales identificadas del siglo XXI son: técnicas, de información, comunicación, colaboración, creatividad, pensamiento crítico y resolución de problemas.
Ananiadou y Claro (2009)	La Organización para la Cooperación y el Desarrollo Económicos (OCDE) ha categorizado las habilidades del siglo XXI como información, comunicación y ética e impacto social.
Hunnius y Schuppan (2013).	Las habilidades consideradas más importantes con relación al gobierno electrónico son la gestión de proyectos, la gestión de procesos, el diseño organizacional, la gestión de riesgos y las habilidades de estrategia de sistemas de información. Así mismo, las competencias personales y sociales evaluadas como muy importantes para la gestión de proyectos de gobierno electrónico fueron la competencia comunicativa, la competencia de autogestión y cooperación, así como el liderazgo.

Fuente: Elaboración propia a partir de autores citados.

Information and communication technology (ICT) is omnipresent in the workplace and there is a great demand for ICT competent employees (Van Laar et al., 2020). In this regard, Table 3 presents a set of competencies that could be considered to mobilize the adoption of Industry 4.0 approaches in the context of public administration in Colombia.

The public administrator and the social appropriation of knowledge: The social appropriation of knowledge necessarily implies having a Public Administrator with broad knowledge on these fronts not only to solve the apparent lag in the evolution of the State, but also to solve difficulties, drawbacks or gaps in training that have prevented him/her from raising the level of application, thought and reasoning regarding the evolution of Public Administration, in order to train public administration scientists capable of evaluating, formulating and making proposals under a high level of knowledge in accordance with the topics considered.

The structural problem of public administrations around the world is a complete lack of iden-

tity. When reforms are proposed, they do not look much beyond the present and only diagnose the problems of the immediate past, and all the prescriptive measures proposed, whether or not they are part of an administrative reform, are very short-term in nature. It is clear that over the last 50 years public administrations have undergone many changes, but these have been very few in terms o f drastically modifying their conceptual paradigm. Today's public systems are too similar to those of fifty or even one hundred years ago. Technology and society advance and transform themselves at a hare's pace and public administrations wander at a snail's pace, if not in the direction of the crab (with significant regressions) or are immobilized for years with the stability and anchorage of a mussel. Politicians, civil servants and scholars of public administration are aware that they are driving such a complicated artifact that they either keep it stationary for fear of not knowing how to lead or they drive it slowly, with low beams and obsessed with observing only the rear-view mirror. (Ramió, 2015, p.1)

In this sense, the social appropriation of knowledge for public administration is based on strengthening not only the human capital trained in this discipline, but also on the possibility of generating research agendas that enable dialogue and knowledge transfer with civil society in order to establish mechanisms for dialogue between the State and the community to generate a social relationship to outline and meet public and institutional objectives. In Colombia, the social appropriation of knowledge is established in the guidelines of the National Strategy for the Social Appropriation of Science (2009), the National Policy for the Social Appropriation of Knowledge (2020) and the draft CONPES document of the CTeI Policy (2021-2030). These institutional guidelines seek to generate synergies between communities, the productive sector, the State and academics not only in the generation of applied research, but also from and for the organization of innovation and science networks aimed at social transformation.

The appropriation of knowledge is understood as a process of relations between science and technology based on the participation of actors that generate knowledge and, therefore, is characterized by an organization and intention, a network of experts in dialogue. There is also an empowerment of knowledge by civil society and interaction is the foundation of innovation and, of course, of social transformation (Urrego et al., 2021, p.12).

Therefore, the challenge for public administrators in Colombia, from their governmental processes and actions, is to manage policies, plans, programs and projects by strengthening an innovation system for local development. This, of course, is possible with the formulation and implementation of science and technology strategies such as research programs that increase the valuation and certainty between the State and the citizenry to address territorial problems. Now, the social appropriation of knowledge has as a basis for the Public Administration to consider issues related to scientific, complex and science, technology and innovation methods hand in hand with social innovation. Although the State has been a protagonist not only in adapting to change but also in leading this process from different conceptions or positions, this has not been the case for the Public Administrator who still remains constrained in the positivist conception, without leading social transformation.

The social appropriation of knowledge gives way to each of the transformations presented from the initial structure to the current one commented on with respect to the State, also condensing the elements and requirements that today's public administration professional must consider in order to understand the context he/she must permanently face and understand that it is permanently susceptible to change. It is from the perspective of the public administration that the

85

PENSAMIENTO
AMERICANO

changes to which the State is exposed, since in essence it is up to the public administrator himself to face these circumstances and from the social appropriation of knowledge to generate and establish dialogues with the communities, with society. Oszlak and O'Donnell (1995):

The current problem of the state is unquestionably centered on the nature and intensity of its transformation. But no serious program of transformation of its institutional apparatus, sustained over time, can be carried out without a profound knowledge of the object of this change. The production of this knowledge is part of a patient process of converting fragmentary data into information, systematizing this information and applying reasoned research techniques to transform it into knowledge. Unfortunately, institutional design, policy formulation and decision-making processes in the public sector in much of Latin America do not seem to be based on premises founded on serious prior research. Our public administrations have a large amount of fragmentary data, scarce information and practically no knowledge. Therefore, the challenge is to organize research programs on the public sector that will provide the knowledge inputs required to guide and modify the strategy for the transformation of its institutional apparatus, so as to respond to the restrictions that are currently operating on public management (p.9).

To strengthen academic, exploratory and investigative contributions is what the social appropriation of knowledge represents for the Public Administrator, to warn about the analyses and approaches that concern the division of the State into powers as a result of the processes brought about by the emergence of the democratic system. The issue involves the qualities, conditions and evaluations of this State professional, as the new approaches that surround him/her are scenarios that make it necessary to recompose the functional and operative character of the public exercise with bases founded on applied and proper research.

States, through their different governments, register important changes that sometimes do not spread as quickly as they are approved. The social appropriation of knowledge is a way of noticing alterations or changes in the management of public administration. In addition to complying fully and effectively with the prescribed activities, the details involved in professional practice in various fields of knowledge are investigated and researched. According to Flores and Nef (1983):

The theoretical and practical development of public administration in Latin America shows how the importance and predominance of political considerations in the administrative processes of the State is increasingly recognized. However, this recognition has been accompanied by very few studies aimed at unraveling the multiple relationships between the political and the administrative, beyond the formal and ideological plane of governmental discourse. Often, both in theory and in practice, only "technical" variables are recognized and acted upon, without attempting to comprehensively manage the interrelationships between these variables and the political (p.57).

The social appropriation of knowledge for the Public Administrator places him/her in a public-social management rather than in a bureaucratic management, since it forces him/her to deepen the research and applied component. Likewise, it obliges him to continue with the idea of cementing criteria attached to the dissemination of knowledge, the approach of social experiences and the transmission of information to advance and generate the necessary impact in the communities and territories. Also, to identify and propose local agendas to address issues such as inequality, extreme poverty, malnutrition, lack of formality, among others.

CONCLUSIONS

The articulating axis of the discussion on the profile of the public administrator in Colombia from an industry perspective.
4.0 and the social appropriation of knowledge is the academic, intellectual and methodological support in the Professional Training of the Public Administrator to address the different problems that the Colombian State must face in its different versions and in turn extend its capacity for action and government in its social and private structures, in order to achieve convergence between social, global and economic demands.

For both Industry 4.0 and the social appropriation of knowledge, the profile of the Public Administrator is based on research and technological development and innovation in the organization and management of the State, citizenship and construction of the public sector, public management and territorial development, public policies and governance, public economics, and, finally, human rights in the perspective of the public sector. To this end, it is imperative to transform a training model and curriculum in public administration that contemplates the generation of knowledge, cooperation through academic and social networks and the articulation between public, private and social institutions based on participatory and interactive methodologies that seek the participation and circulation of knowledge. In this sense, the need to introduce changes in education and training curricula and the delivery of training can lead people to obtain qualifications that do not fit well with the new skill needs of employers (OECD and ILO, 2018), which is why it is required that both universities and public entities implement agile plans to meet the changes that the new forms of public administration require in this area.

This is because today's public administration requires professionals, trained in their specific knowledge, capable of identifying in technology an element that will facilitate the transformation of multiple activities in relation to what is currently being developed. This is why the public administrator should develop competencies not only for the application of the new technologies proposed in Industry 4.0, but should also be an active actor for the unification of capacities with other public and private organizations, since cooperation could facilitate the processes of development and incorporation of new technologies. As public administrators are active players in technological transformation, they must recognize new possibilities for joint work in their territory, at national and international level, which will allow the public organizations in which they work to establish links to make technological adoption closer to the realities of the territories, and ultimately to achieve the social appropriation of this knowledge, specifically in new technologies.

In terms of the social appropriation of knowledge, the Public Administrator's challenge is to generate and strengthen a territorial governance that is in the direction of building and proposing topics that no longer lies only in the review of the fulfillment of its purposes or functions, but in the identification of problems that require research and generation of knowledge on public-social issues that afflict the territory in terms of environmental damage and risks, exploitation and extraction of mining resources, employment generation, conflict and security, public-private partnerships, incursion into physical and engineering infrastructure projects, among others. Likewise, to have a competence in the management of strategic projects that involve the communities not only to meet their needs, but also to establish with them a route of expectations and possible projects.

87

With the social appropriation of knowledge, the function of the Public Administrator in Colombia is expected to trace, within the framework of the purposes and functions of the State, the effectiveness of governmental actions and to broaden social participation. The problems that this professional deals with today are abundant and superior to a strictly operative character with a low academic, investigative and propositive level. Therefore, the social appropriation of knowledge obliges the Public Administrator to affirm the opposite, in moments in which several structural institutional crises framed in the bad public management are going through, from the generation of knowledge that promotes institutional and social capacities at the moment of intervening in the territories.

This professional in Public Administration should be clearly aware of the commitment of what it implies to be located in the orientation of the methods and/or methodologies of research focused on the appropriation of knowledge, parameter from which it is possible to understand what it implies to implement proposals that claim the scientific and social character of data to generate planning and evaluation processes of plans, programs and public policies that enable innovative decision making, issues for which the apprehension of designs, tools and complementary and proper instruments of his work place him in the possibility of providing organizational, managerial and administrative processes that enable innovative decision making, This is a matter for which the acquisition of designs, tools and instruments that are complementary and specific to its work, place it in a position to provide organizational and managerial processes and the construction of social agendas.

In terms of Industry 4.0, the profile of the public administrator has, from the generation of knowledge, the challenge of generating competencies and capabilities in processing information for the creation of a digital record of the artisanal processes carried out by public organizations and classifying them under a results approach. Likewise, this information is shared and interpreted through the use of advanced analytics that allow the analysis of public-social scenarios required for planning and state action. Such analytics is based on artificial intelligence that allows the production, classification and publication of information relevant to both the organization of the State and social issues. It also translates predictions and algorithmic modeling into effective data that stimulate participation and public actions in the social and institutional spheres.

On the other hand, also the competencies of the Public Administrator through the social appropriation of knowledge, is the consolidation of public management in Colombia in terms of the production of knowledge and knowledge about the role of the contemporary State and its responsibility in public interventions, through the creation of a model of knowledge management, not only as the work of scientists-academics, but its transfer and circulation is the key to social transformation from the local level.

PENSAMIENTO
AMERICANO

REFERENCES

Ananiadou, K. y Claro, M. (2009). 21st century skills and competences for new millennium learners in OECD countries. In OECD *Education Working Papers* (Issue 41). http://dx.doi.org/10.1787/218525261154

Angiola, N. y Bianchi, P. (2015). Public Managers' Skills Development for Effective Performance Management: Empirical evidence from Italian local governments. *Public Management Review, 17*(4), 517–542. https://doi.org/10.1080/14719037.2013.798029

Barzelay, M. (2003). La Nueva Gerencia Pública: invitación a un diálogo cosmopolita. *Gestión y Política Pública,* XII(2).

Blanco-Peck, R. (2006). Los Enfoques Metodológicos y la Administración Pública Moderna. *Cinta moebio 27.* 34-42. https://www.redalyc.org/articulo.oa?id=10102704

Brinkerhoff, D. W. y Brinkerhoff, J. M. (2015). Public Sector Management Reform in Developing Countries: Perspectives Beyond NPM Orthodoxy. *Public Administration and Development, 35*(4), 222–237. https://doi.org/10.1002/pad.1739

Buenhombre, E. y Vanegas, T. (2017). Laboratorios en innovación como estrategias de mejora continua del Estado. *XXII Congreso Internacional del CLAD sobre la Reforma del Estado y de la Administración Pública. Madrid, España, 14 - 17 nov. 2017.* 1-14. https://www2.congreso.gob.pe/sicr/cendocbib/con5_uibd.nsf/C5BCAE6802CE4D-830525823B004F26B6/$FILE/buenhmor.pdf

Bunk, G. (1994). La transmisión de las competencias en la formación y perfeccionamiento profesionales de la RFA. *Revista Europea de Formación Profesional, 1, 8–14.*

Carretero, S., Vuorikari, R. y Punie, Y. (2017). DigComp 2.1: The Digital Competence Framework for Citizens. With eight proficiency levels and examples of use. *In Publications Office of the European Union.* http://publications.jrc.ec.europa.eu/repository/bitstream/JRC106281/web-digcomp2.1pdf_(online).pdf

Centro Latinoamericano de Administración para el Desarrollo (CLAD). (1999). Una nueva gestión pública para América Latina. *Economía y Sociedad* (Issue 9).

Centro Latinoamericano de Administración para el Desarrollo. (2007). *Carta Iberoamericana del Gobierno Electrónico* (Vol. 2007, Issue 18).

Criado, J. I. (2021). Digital Public Administration in Latin America: Digitalization, Public Innovation, and the Future of Technologies in the Public Sector. *En The Emerald Handbook of Public Administration in Latin America.* https://doi.org/10.1108/978-1-83982-676-420201014

Decreto 1227, 2005. (2005, 21 de abril). El presidente de la República de Colombia. *Diario Oficial No. 45.*890. https://www.funcionpublica.gov.co/eva/gestornormativo/norma.php?i=16313

Decreto 1499/17. (2017, 11 de septiembre). Presidencia de la República de Colombia. Diario Oficial: No. 50.353. https://www.suin-juriscol.gov.co/viewDocument.asp?ruta=Decretos/30033473

Decreto 815/18. (2018, 8 de mayo). Presidencia de la República de Colombia. *Diario Oficial: No. 50.587.* https://www.funcionpublica.gov.co/eva/gestornormativo/norma.php?i=86304

Decreto Ley 760, 2005. (2005, 19 de marzo). El presidente de la República de Colombia. *Diario Oficial No. 45.855.* https://www.funcionpublica.gov.co/eva/gestornormativo/norma.php?i=16124

Decreto Ley 770, 2005. (2005, 17 de marzo). El presidente de la República de Colombia. *Diario Oficial No. 45.855.* http://www.secretariasenado.gov.co/senado/basedoc/decreto_0770_2005.html

Departamento Administrativo de la Función Pública. (2018). *Resolución 0667 de 2018.* https://www.funcionpublica.gov.co/eva/gestornormativo/norma.php?i=89259

Departamento Administrativo de la Función Pública. (2021a). *Manual operativo del modelo integrado de planeación y*

89

gestión (p. 98). https://www.funcionpublica.gov.co/documents/28587410/34112007/Manual+Operativo+MIPG.pdf/ce5461b4-97b7-be3b-b243-781bbd1575f3

Departamento Administrativo de la Función Pública. (2021b). P*lan Nacional de Competencias Laborales en el sector público.*

Donadelli, F., Cunha, B. Q. y Dussauge-Laguna, M. I. (2020). 'Post-NPM' by force or fiat? A comparison of administrative reform trajectories in Brazil and Mexico. P*ublic Administration and Development, 40*(5), 255–266. https://doi.org/10.1002/pad.1897

Fareri, S., Fantoni, G., Chiarello, F., Coli, E. y Binda, A. (2020). Estimating Industry 4.0 impact on job profiles and skills using text mining. *Computers in Industry, 118, 103222.* https://doi.org/10.1016/j.compind.2020.103222

Fierro, F. A. (2017). Las competencias laborales en el sector público: un análisis desde las escuelas de las competencias laborales. *Administración y Desarrollo, 47(2),* 92–108. https://doi.org/10.22431/25005227.366

Flores, G. y Nef, J. (1983). Nuevos enfoques en administración pública: elementos para la discusión. *Revista Centroamericana de Administración Pública (5)*, 57-70.

Guerrero Serón, A. (1999). El enfoque de las competencias profesionales: una solución conflictiva a la relación entre formación y empleo. R*evista Complutense de Educación, 10(1),* 335–335. https://doi.org/10.5209/RCED.18144

Guerrero, O. (2003). Nueva gerencia pública: ¿Gobierno sin política? *Revista Venezolana de Gerencia, 8(023),* 379–395.

Guerrero, O. (2019). Neoliberalismo y Neogerencia. *REAd-Revista Electronica de Administracao, 25(2),* 4–21.

Hawes, G. y Corvalán, O. (2005). Construcción de un perfil profesional. Universidad de Talca. https://www.academia.edu/1177073/Construcci%C3%B3n_de_un_perfil_profesional

Hermann, M., Pentek, T. y Otto, B. (2016). Design principles

for industrie 4.0 scenarios. *Proceedings of the Annual Hawaii International Conference on System Sciences, 2016-March,* 3928–3937. https://doi.org/10.1109/HICSS.2016.488

Hoffmann, T. (1999). The Meaning of Competence. *Journal of European Industrial Training, 23(6),* 275–285. https://doi.org/10.4324/9780203814796-13

Hunnius, S. y Schuppan, T. (2013). Competency requirements for transformational e-government. *Proceedings of the Annual Hawaii International Conference on System Sciences, 1664–1673.* https://doi.org/10.1109/HICSS.2013.139

Jurado-Zambrano, D., y Valencia, S. (2021). Gestión del Conocimiento: *Caso de una Entidad del Sector Público Colombiano. Tendencias, XXII(2), 130–156.*

Lasi, H., Fettke, P., Kemper, H. G., Feld, T. y Hoffmann, M. (2014). Industry 4.0. *Business and Information Systems Engineering,* 6(4), 239–242. https://doi.org/10.1007/s12599-014-0334-4

Ley 909, 2004. (2004, 23 de septiembre). Congreso de la República de Colombia. *Diario Oficial: 45.680* http://www.secretariasenado.gov.co/senado/basedoc/ley_0909_2004.html

Lukac, D. (2015). The fourth ICT-based Industrial Revolution "Industry 4.0"- HMI and the case of CAE /CAD innovation with EPLAN P8. 23rd *Telecommunications Forum TELFOR 2015, 835–838.*

McClelland, D. C. (1973). Testing for competence rather than for "intelligence." *The American Psychologist, 28(1),* 1–14. https://doi.org/10.1037/h0034092

Moore, M. H., Sparrow, M. & Spelman, W. (1997). Innovations in Policing: From Production Lines to Job Shops. *In Innovation in Policing (pp. 274–298).*

Ni, A. Y. y Chen, Y. C. (2016). A Conceptual Model of Information Technology Competence for Public Managers: Designing Relevant MPA Curricula for Effective Public Service. *Journal of Public Affairs Education, 22(2),* 193–212. https://doi.org/10.1080/15236803.2016.12002241

90

OECD y ILO. (2018). *Approaches to anticipating skills for the future of work (Issue June).* https://www.ilo.org/global/about-the-ilo/how-the-ilo-works/multilateral-system/g20/reports/WCMS_646143/lang--en/index.htm

Osborne, D. T. y Gaebler, T. (1992). *Reinventing Government.* P. Group.

Oszlak, O. y O'Donnell, G. (1995). Estado y políticas estatales en América Latina: hacia una estrategia de investigación. *Redes, 2(4),99-128.* https://www.redalyc.org/articulo.oa?id=90711285004

Peña Vera, T. y Pirela Morillo, J. (2007). La complejidad del análisis documental. Información, *Cultura y Sociedad, 0(16), 55–81.* https://doi.org/10.34096/ics.i16.869

Pollitt, C. y Bouckaert, G. (2017). Public Management Reform: A Comparative Analysis-into the Age of Austerity. In Oxford University Press (Ed.), *Paper Knowledge . Toward a Media History of Documents.* Oxford University Press.

Programa de las Naciones Unidas para el Desarrollo. (UNDP) (2015). From Old Public Administration to the New Public Service. Implications for Public Sector Reform in Developing Countries. *UNDP Global Centre for Public Service Excellence.* http://www.undp.org/content/dam/undp/library/capacity-development/English/Singapore Centre/PS-Reform_Paper.pdf

Ramió, C. (2015). *La Administración Pública del Futuro: La Administración "2050" GIGAPP Grupo de Investigación en Gobierno, Administración y Políticas Públicas. Programa de Doctorado en Gobierno y Administración Pública. Instituto Universitario de Investigación Ortega y Gasset. 1-44.* http://gigapp.org/index.php/publicaciones/working-papers-gigapp98

Roblek, V., Meško, M. y Krapež, A. (2016). A Complex View of Industry 4.0. *SAGE Open, 6(2).* https://doi.org/10.1177/2158244016653987

Roll, M. J. J. y Ifenthaler, D. (2021). Multidisciplinary digital competencies of pre-service vocational teachers. *Empirical Research in Vocational Education and Training, 13(1).* https://doi.org/10.1186/s40461-021-00112-4

Ruhlandt, R. W. S. (2018). The governance of smart cities: A systematic literature review. *Cities, 81(October 2017),* 1–23. https://doi.org/10.1016/j.cities.2018.02.014

Soe, R. M. y Drechsler, W. (2018). *Agile local governments: Experimentation before implementation.* 323–335. https://doi.org/10.1016/j.giq.2017.11.010

Sotirakou, T. y Zeppou, M. (2004). The " MATE " model : a strategic knowledge management technique on the chessboard of public-sector modernization. *Management Decision, 42(1),* 69–88. https://doi.org/10.1108/00251740410504430

Stoker, G. (2006). Public Value Management. A New Narrative for Networked Governance? *American Review of Public Administration, 36(1), 41–57.*

Thoben, K. D., Wiesner, S. A. y Wuest, T. (2017). "Industrie 4.0" and smart manufacturing-a review of research issues and application examples. *International Journal of Automation Technology, 11(1),* 4–16. https://doi.org/10.20965/ijat.2017.p0004

UNESCO. (1998). Declaracion Mundial Sobre la Eduación superior en el siglo XXI: Visión y acción. *Educación Superior y Sociedad, 9(2), 97–113.* https://www.iesalc.unesco.org/ess/index.php/ess3/article/view/171/162

Urrego-Estrada, G., Gutiérrez-Ossa, J. y Jurado-Zambrano, D. (2021). Gestión del conocimiento en las Instituciones de Educación Superior para la apropiación social del conocimiento. *Pensamiento Y Acción, (31),* 27-51. https://doi.org/10.19053/01201190.n31.2021.12492

Uvalle, R. (2009). Condiciones, procesos y tendencias de la administración pública contemporánea. *Convergencia. Revista de Ciencias Sociales, 16(49),73-102.* https://www.redalyc.org/articulo.oa?id=10504904

Vaitkevičius, V. (2018). The Importance of Knowledge Management for the Innovativeness of the Public Sector. *Informacijos Mokslai, 83(83), 36–51.* https://doi.org/10.15388/im.2018.83.3

Van der Wal, Z. y Demircioglu, M. A. (2020). Public sector inno-

Artículo de Reflexión

91

PENSAMIENTO AMERICANO

vation in the Asia-pacific trends, challenges, and opportunities. *Australian Journal of Public Administration, 79(3),* 271–278. https://doi.org/10.1111/1467-8500.12435

Van Laar, E., van Deursen, A. J. A. M., van Dijk, J. A. G. M. y de Haan, J. (2017). The relation between 21st-century skills and digital skills: A systematic literature review. *Computers in Human Behavior, 72, 577–588.* https://doi.org/10.1016/j.chb.2017.03.010

Van Laar, E., van Deursen, A. J. A. M., van Dijk, J. A. G. M. y de Haan, J. (2020). Determinants of 21st-Century Skills and 21st-Century Digital Skills for Workers: A Systematic Literature Review. *SAGE Open, 10(1).* https://doi.org/10.1177/2158244019900176

Walker, R. M., Damanpour, F. y Devece, C. A. (2011). Management innovation and organizational performance: The mediating effect of performance management. *Journal of Public Administration Research and Theory, 21(2),* 367–386. https://doi.org/10.1093/jopart/muq043

Wang, S., Wan, J., Li, D. y Zhang, C. (2016). Implementing Smart Factory of Industrie 4.0: An Outlook. *International Journal of Distributed Sensor Networks, 2016.* https://doi.org/10.1155/2016/3159805

Yang, F. y Gu, S. (2021). Industry 4.0, a revolution that requires technology and national strategies. *Complex & Intelligent Systems.* https://doi.org/10.1007/s40747-020-00267-9

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