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<u>MASTER THESIS</u>

"Digital Transformation of the Greek Public Sector: Evaluation and Development Strategies"

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Short CV

A young and energetic professional eager to utilize the experience already acquired to enhance knowledge gained. Project management specialist, with hands on experience and a proven track of success, who has worked in competitive & demanding environments, leading technical projects and gaining hands on experience on ICT infrastructure implementations for challenging workspaces such as a metropolitan International Airport and a multi-million euros Telco. Shown proven ability to adapt to changing circumstances. Successful results have been the outcome of long hours of team work, persistence, commitment and a natural inclination of accepting professional challenges as a cause for continuous improvement.

Responsible to setup the Project Management Office within the Division. Working directly with the Head of the Division and cooperating with a team of 12 Project Managers establishing the norms & procedures that will formalize the setup of the PMO under a proven methodology (PMI).

Responsible to run the full programme of upgrading the services and operations of the Archaeological sites of Greece as well as the operations of the Fund of Archaeological Proceeds (TAPa) in a threefold manner; the ticketing platform, the introduction of automated POS in the sites and the implementation of an ERP as the main Back Office Platform. The programme involves the coordination of one major subcontractor (IBM) and another 12 different entities that are under the subcontractor and the progress reporting to the Steering Committee which consists of the Greek State representatives, the Fund's executive Management and the Sponsors' representatives (National Bank of Greece, Stavros Niarchos Foundation).

Responsible to run the Microsoft Enterprise Agreement with General Secretariat of Information Systems, on behalf of OTE.

Abstract

The present thesis analyzed the concept of digital transformation of the Greek Public Administration, focusing on the evaluation and development strategies that will contribute to moving towards a digital economy. The main axes that were theoretically analyzed are Public Administration, Digital transformation and Governmental digitalization. With reference to Greece, the 'Digital Transformation Paper' reflects the new national digital strategy, including many IT projects, some in a short-term and other in a longer-term preparation. Greece ranks low in international indicators with reference to its digital maturity across countries around the world. Our country has faced many difficulties in implementing gradual and evolutional digital strategies. The rapid speed of technological change, combined with the low digital maturity of Greece, creates the urgent need for the country to act immediately for strengthening Digital Governance.

The present research was based on a mixed method, via a combination of quantitative and qualitative research, using as research tools the questionnaire and the interview respectively. The sample of the quantitative research consisted of 150 employees in the public sector of Greece. With reference to the qualitative research, semi-structured, open – ended "elite" interviews were applied, into four different sections: interview to the EU, interview to the Greek Government, interview to Greek Enterprises and interview to Greek Public Sector. Finally, a case study was referred to Organization of Management and Development of Cultural Resources (ODAP). The respondents in this research were ten in number.

The analysis highlighted the importance of digital transformation of the Greek Public Sector, via effective evaluation and development of strategies that will generate the conditions for adopting the great benefits which come from the implementation of such projects and tools. Next steps towards the digital transformation are arising and Greece must capture the chance to overcome difficulties and obstacles in order to reach to a more efficient level of governmental digitalization.

Keywords: Public Administration, Digital Transformation, Governmental Digitalization, Greece.

Introduction

Digital revolution largely judges the development of the national economies and the well-being of societies. It is nowadays fundamental to give emphasis on human skills and entrepreneurship with the support of digital infrastructure and of a Digital State. Greece has realized the necessity of its transition to the digital economy and society. The digital transformation of the country is an immediate need and priority. To achieve this goal, Digital Governance must operate in a coordinated manner with the public and private sector, the country's research and technological bodies, the academic and scientific community and civil society for the digital transformation of Greece, the modernization of public administration, the better service of the citizen and the business, but also for the creation of new, additional sources of economic growth. In this context, Greece has set a national strategy for the digital transformation of the entire Greek society and economy with specific objectives and a structured action plan, which reflects the guiding principles and the necessary short- and medium-term interventions that will successfully implement the Greek vision for Digital Greece.

In the coming years, it is of high importance to utilize the potential of information and communication technologies as a tool of modern governance and a lever of growth towards a "Digital Greece". Through coordinated actions, digital transformation interventions will effectively respond to the modern challenges of the digital age. To achieve this, citizen-user must be positioned at the center of the redesign and implementation of new digital services, via applying collaborative and flexible models for the design and implementation of new digital solutions. At the same time, it is important for Public Administration to adopt a favorable culture in relation to the application of new digital tools and enhance the digital training of its human resources.

Besides, as demonstrated by recent experience in managing the consequences of the COVID-19 pandemic, the digital transformation of the public and private sectors, as well as the appropriate digital skills of human resources, are decisive factors for the uninterrupted functioning of the state and the economy, even in extreme crisis conditions. Digital projects in Public Administration can enhance transparency, inclusivity, accessibility, privacy and security of citizens and businesses, while ensuring the existence of a nationwide, modern communication and connectivity infrastructure.

Government action fosters today the production of innovation, supports start-ups and enhances the breadth and availability of open and quality data to implement innovative services and strengthen the digital economy. Aiming at the maximum utilization of new digital services, the new policy of digital transformation also focuses on providing incentives to businesses and population groups for the faster adoption of digital technologies and the further development of digital skills in Greek society. In the coming years, through effective strategic planning and disciplined implementation of digital transformation, Greece is strengthening its international digital identity and competitiveness. The digital transformation of the country is a great challenge and at

the same time, it is a gigantic, complex and difficult task. The implementation of this project requires clear strategy, vision, philosophy, method, as well as the implementation of important interventions.

Under the above framework, the present thesis refers to the concept of digital transformation of the Greek Public Administration, focusing on the evaluation and development strategies that will contribute to moving towards a digital economy. The first chapter presents the problem statement, the main definitions and the literature review. Chapter 2 is the theoretical part of the thesis is based on three themes: Public Administration, Digital transformation and Governmental digitalization and next, Chapter 3 refers to the Digital Transformation Paper 2020-2025. The following sections refer to the research part of the thesis. Chapter 4 presents information about the Methodologies applied in the research. For the purpose of this research, a mixed method is applied, via a combination of quantitative and qualitative research, using as research tools the questionnaire and the interview respectively. Further, a case study is analysed, by studying the digital transformation of the Hellenic Organization of Cultural Resources Development, under the auspices of the Ministry of Culture & Sport. Chapter 5 presents the Results of the mixed research method. Finally, Chapter 6 refers to the main conclusions of the analysis.

Chapter 1. Problem statement, definitions and literature review

1.1 The examined theme and the scope of the thesis

The present thesis refers to the concept of digital transformation of the Greek Public Administration, focusing on the evaluation and development strategies that will contribute to moving towards a digital economy.

Greece has realized the necessity to effectively respond to both the modern challenges of the digital age, as well as the ongoing extreme crisis conditions. In the context of the implementation of the "National Strategy for Digital Transformation of the Greek Society and Economy", a significant dimension is the transformation and modernization of the state mechanism to better serve the citizen and the business. At the same time, Europe that has established a roadmap for a successful digital transformation by 2030, named "digital decade" has set as one of its four fundamental points, the digitalization of the public services. Digital Transformation is not a future undefined event, it is rather an imminent need, given the fact that it is primarily a matter of survival and consequently a growth factor.

In view of the above, the present thesis aims to examine the following:

1. What are the essential elements for the digital transformation of the public administration?

2. Which are the main difficulties and obstacles identified for Digital Transformation within the public administration of Greece?

3. How does the European Union's strategy guide the State's digital development?

4. How is the current national digital strategy for the digital transformation of the public administration oriented?

5. How is the digital maturity of Greece's public administration analysed and how is it compared to other countries through statistical data and indicators?

For the purpose of this research, a mixed method is applied, via a combination of quantitative and qualitative research, using as research tools the questionnaire and the interview respectively. Further, a case study is analysed, by studying the digital transformation of the Hellenic Organization of Cultural Resources Development, under the auspices of the Ministry of Culture & Sport.

1.2 Main definitions

1.2.1 Public Administration

Administration is a term derived from the Latin words 'ad' = to and 'ministiare' = serve. Public is a term that means people or citizens. The term administration means to execute the policy of government (Fowsar, n.d.). The term Public Administration refers to "all the legal means and actions that aim at achieving a specific result for the satisfaction of the general interest of the citizens of a State. The Public Administration of a country is part of its State mechanism and in the broad sense, it includes two sub-concepts, that of the Government and the Administration" (Spiliotopoulos, 2007). According to Cendrowicz (n.d.), "public administration is understood to be overtaken by the state and realized by its pending bodies and also by the bodies of the local self-government fulfilling collective and individual needs of citizens, resulting from the people's coexistence in communities". Thapa (2020) supports that "public administration is the detailed a systematic execution of public law. It is a cooperative effort of a group of people in pursuit of common objective in the process of managing public affairs". A complete definition for public administration however is difficult to be stated, as the term has a wide orientation. While some researchers state that "public administration consists of all those operations having for their purpose the fulfillment or enforcement of public policy, others support that it is a detailed and systematic application of law". In general, "public administration includes the policies, practices, rules and regulation in action" (Management Study Guide, 2021). Public Administration has as a purpose "to promote a superior understanding of government and its relationship with the society it governs, as well as to encourage public policies more responsive to social needs" (Balucanag - Bitonio, 2016).

1.2.2 Digital transformation

Digital transformation refers to "adopting disruptive technologies to increase productivity, value creation, and the social welfare". It is driven by software technologies and is considered to be a mega trend in the today industries and government environments (Ebert and Duarte, 2018). It is "the integration of digital technology into all areas of a business, fundamentally changing how you operate and deliver value to customers. It is also a cultural change that requires organizations to continually challenge the status quo, experiment, and get comfortable with failure" (Enterprisers Project, 2021). According to Salesforce (2021), "digital transformation is the process of using digital technologies to create new — or modify existing — business processes, culture, and customer experiences to meet changing business and market requirements". It is "the strategic adoption of digital technologies that is used to improve processes and productivity, deliver better customer and employee experiences, manage business risk, and control costs" (Citrix Systems, 2021). CIOPages.com (2021) defines digital transformation as "a fundamental rethinking of the doing, thinking, and being of corporations to thrive in the digital age, that involves a foundational restructuring of people, operating model, processes, data, capabilities, and technology".

With reference to Schallmo, Williams and Boardman (2017), digital transformation "includes the networking of actors such as businesses and customers across all value-added chain segments and the application of new technologies. It requires skills that involve the extraction and exchange of data as well as the analysis and conversion of that data into actionable information. Digital transformation involves companies, business models, processes, relationships, products, etc." As Mergel, Edelmann and Haug (2019) support, digital transformation is a term adopted from the private sector that is mainly associated with the need to utilize new technologies to keep competitive in the Internet age. In the public sector literature, this is oriented under the term of "e-government".

1.2.3   Governmental digitalization

Governmental digitalization refers to "public sector reforms through the adoption of information and communication technology (ICT) solutions in order to optimize operations and provide better services to customers – or citizens". By adopting the rapidly evolving technology, cost-efficiency and quality are achieved at internal and external processes and this results to better services for citizens (Lappi, Aaltone and Kujala, 2019). Fountain (2014) defines digital government as "the use of information and communication technologies in governance". As she supports, the topic is broad and includes "political, governance and policymaking behavior, structures, processes, outputs and outcomes at all levels of government from local to global". Finally, as Barcevičius et al (2019) state, "digital transformation in government means transition from fully integrated web presence to intelligent government in which technology has penetrated and changed all functions at all levels". In many cases, researchers relate digital government transformation to the application of technologies in government, such as blockchain, Internet of Things or artificial intelligence.

1.3 Existing research and current situation

The concept of digital transformation of the public administration is a process that requires the implementation of a model of administration, covering horizontally all actors in general government and the wider public sector. Such a governance model defines the roles and responsibilities of the public administration bodies under the principles of transparency, efficiency, higher productivity, availability and higher quality of services (Tolbert and Mossberger, 2006). Digital transformation of the public administration has been seen as the treatment of rigidity, procedurality, inefficiency and inability to serve the needs of citizens, by increasing access and improving the provision of services. As reported by van Duivenboden and Lips (2003), personalized solutions to the citizen are a key element of the successful adoption of digital transformation of government. According to Jain (2004), the existence of trust in digital transformation of the public administration is presented in the literature as an essential element that is necessary for its successful adoption. Other factors that are considered to be essential

for the digital transformation of the public administration are leadership, infrastructure, information management, human resources and organizational culture of public sector (Hidayanto et al., 2014):

- Leadership is a factor related to priorities and initiatives for anticipating and exploiting technological developments. The leader significantly influences the implementation of digitalization, as his/ her lack of plans and strategies is one of the factors that contributes to the failure of the implementation of digitalization.
- Infrastructure must be adequate and able to provide users with access to data. Infrastructure must comply with hardware and software standards and information technology standards must be implemented, as their lack is a factor that hinders the implementation of digitalization.
- Information management is also an essential factor for the digital transformation of the public administration. If the information is not properly managed, it will have an impact on the implementation of digital processes. Information management is related to the quality and management of information, starting from the creation and continuing to the processing, storage and distribution of information. Creating a trust environment is essential and this can take place through a high level of data privacy, data integrity and user authorization that will ensure the security of electronic transactions.
- Human resources are the most valuable resource of a business or an organization. In order for the implementation of digitalization to be successful, it is necessary to train and educate the human resources on the IT tools and achieve optimal levels of awareness about digitalization of government.
- Organizational culture can also influence the implementation of digital processes. The reason is that if there is no readiness in the organization to accept change, then the resistance of employees to change will prevent the adoption of the new technologies.

According to the Digital Public Administration factsheet 2020 European Union, at the political level, the newest and main initiatives that will drive the digitalisation of the public sector in Europe are the Shaping Europe's Digital Future strategy, the White Paper on Artificial Intelligence, the Strategy for a sustainable and digital Europe, the Action Plan for better implementation and enforcement of single market rules, a new Industrial Strategy for a globally competitive, green and digital Europe, and the European Data Strategy. These initiatives are a key part of one of the European Commission's top priorities for 2019-2024 set out by Ursula van der Leyen in July 2019, A Europe Fit for the Digital Age, and they build off initiatives from the Juncker Commission, including the Digital Single Market and the EU eGovernment Action Plan 2016-2020. Another key actor working to improve digitalisation and interoperability in public administrations is the Directorate-General for Informatics' (DIGIT), whose role is to support Member States in the modernisation of their public administrations by

promoting and facilitating interoperability so that European public administrations can work seamlessly and together across boundaries. Besides strategies and policy instruments, the European Commission also implements a number of legislative initiatives related to the modernisation of the public sector. The EU also provides funding instruments available to Member States, such as the European Structural and Investments Funds (ESIF), the Connecting Europe Facility (CEF) and ISA2 programmes. These funding instruments, together with freely reusable solutions, significantly contribute to the public sector modernisation at national and regional levels. As part of the new Multiannual Financial Framework for the period 2021-2027, the European Commission has proposed a new funding programme: the Digital Europe Programme, whose goal will be to set up the strategic digital capacities of the EU and to promote a farreaching deployment of new technologies, to be used by the EU's citizens and businesses. Lastly, the EU also offers other support services such as peer-to-peer help, platforms to exchange best practices and practical guidance.

With reference to Greece, as it is stated at the Digital Public Administration Factsheet 2020, the National Program for Process Simplifications (NPPS) established by law 4635/2019 provides the central intergovernmental framework, under the high supervision of the Prime Minister, aiming at the reduction of administrative burdens e.g. via the redesign and simplification of administrative processes, the modification, adaptation and simplification of the regulatory framework, the digitization of procedures and the improved interoperability of information systems, the improvement of information provided to citizens and enterprises about administrative procedures as well as the upgrading of physical service points. The 'Digital Transformation Paper' reflects the new national digital strategy, including many IT projects, some in a short-term, the so-called "Quick-win" projects and other in a longer-term preparation. Under the law 4635/2019 is foreseen the development of a Single digital public administration portal, the so-called 'gov.gr', which will gather all digital public services under one single portal, and the development of the open Single Digital Map which will collect and centralise geospatial data such as land use and building planning. With law 4623/2019 Ministry of Digital Governance is designated to co-ordinate the processing of all non-personal data of the public sector. Thanks to the Information System Interoperability Centre, a faster and easier interconnection between registries can be achieved. The law 4624/2019 establishes additional measures for the implementation of the General Regulation Data Protection ("GDPR") and incorporates Directive (EU) 2016/680. The Ministry of Digital Governance is a new element in the Greek government bringing together all the Information Technology and Telecommunications infrastructure, related to the provision of digital services to citizens and businesses in the country. Its strategic target is to provide the necessary framework for citizens and businesses in Greece to truly benefit from an inclusive Digital Single Market in the European Union, having the ability to both design and use effective digital services in a broad range of sectors including public administration, justice, health, energy, and transportation. As about the Digital Public Administration Infrastructure, the first version of the central governmental portal (gov.gr) was launched in March 2020 by the

Ministry of Digital Governance and collects all the 507 services provided digitally by the State. Each new service that will be digitized in the future will be integrated in the platform. Citizens can access eServices using their TAXISNET credentials, which will be transformed and enhanced by a two-factor authentication (OTP) horizontal mechanism in the near future.

Greece ranks low in international indicators with reference to its digital maturity across countries around the world. For example, the country ranks 27th among the 28 EU countries regarding the Digital Economy and Society Index (DESI), 42nd among 193 states regarding the E-Government Development Index (EGDI), 27th out of 28 EU countries regarding the ICT Development Index (IDI), 25th among EU countries in the Digital Evolution Index (DEI), as well as 43rd out of 115 states with reference to the Enabling Digitalization Index (EDI). With regard to the digital public services dimension, Greece ranks 27th among the 28 EU Member States, with a score of 51.5 compared to 72.0 of the EU average. In relation to the provision of online public services, Greece has made progress in recent years, but is still significantly below the EU average. The number of internet users who are active users of digital government services is 39% and is still well below the EU average of 67% (Digital Transformation Paper 2020-2025).

Greece has faced many difficulties in implementing gradual and evolutional digital strategies, as other digitally developed countries have done today (e.g., Norway, Finland, as map 1 shows). These countries began their digital transformation several years ago, while the pace of technological developments was still low, implementing gradual steps, which were regularly redefined to meet their changing national objectives and integrate emerging digital technologies. Except the concept of time, among the most important difficulties and obstacles of the digital transformation within the public administration of Greece is the absence of digital literacy of citizens (especially the elderly) who do not have the critical skills necessary in order to achieve a full and effective use of ICT. What is more, education on ICT in often missing with reference to the public sector employees. Lack of internal capacities, infrastructure and personnel are factors that are considered to be obstacles for the development of digital technologies in the public sector (Digital Transformation Paper 2020-2025).
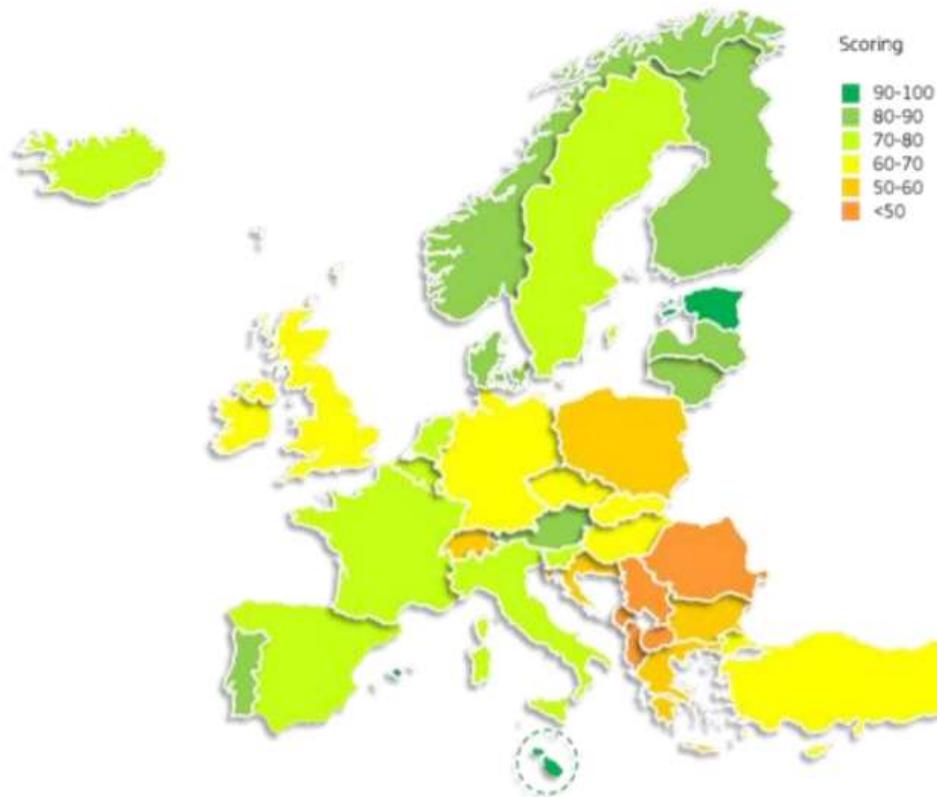
Source: eGovernment Benchmark Report 2020 Insight Report

Map 1 development of eGovernment in Europe

(Digital Public Administration factsheet 2020 European Union, p.9)

The overall situation in Greece remains problematic. Public Administration continues to be characterised by costly, time-consuming and inhospitable services, complex procedures, bureaucracy and opacity. There is often a piecemeal approach to eGovernment issues with intense fragmentation, poor interconnection and exploitation of existing systems and an important time horizon from the start to the delivery of a project. A multitude of actors are involved, resulting in waste in the use of available resources and inefficiency due to overlaps and contradictions in the way public services are supported. Public Administration should take advantage of the benefits that the successful e-government actions of foreign countries have highlighted and incorporate these good practices in terms of shaping ideas, setting priorities, as well as methods and principles of implementation. Of course, a remarkable scientific and professional staff in computer science and new technologies is needed, being able to understand the rapid development of technology and the possibilities of e-government in the country, as well as taking advantage of the opportunities for a faster development. It is necessary to act under a coordinated effort, with clear and complete steps and rules, in order to have a total benefit from the application of the methods and practices of e-government, in all

areas of social and economic activity in the current changing environment (Spinellis, 2018).

The rapid speed of technological change, combined with the low digital maturity of Greece, creates the urgent need for the country to act immediately, on multiple axes, through the implementation of a "holistic" digital approach. Steps have already been taken in this direction, such as, for example, the important technological solutions developed very rapidly by the Ministry of Digital Governance to deal with the consequences of the coronavirus pandemic. Only through such a direct, coordinated and organized approach Greece will be able to accelerate its digital transformation, thus improving its position in indicators related to technology and innovation (Digital Transformation Paper 2020-2025).

Chapter 2. Theoretical background

2.1 Public Administration

Theories on public administration are categorized into classical and modern. According to the classical theory of public administration, the public interest is considered to be a central concept in the understanding and practice of the public sector. In fact, the public interest can be ensured through a neutral class of public officials whose task is to implement government decisions. The key to understanding the argument of classical theory is rationality, i.e., faith in the rational and impartial action of public officials in order to defend the public interest. The theoretical basis of the above is derived from W. Wilson, Fr. Taylor (in the USA) and M. Weber (in Germany).

The Bureaucratic Management Model prevailed from the late 19th century until the late 1970s and in some cases until the early 1980s. The term bureaucracy has a French origin and attributes the structure and operation of the public administration developed in France at the end of the 18th century. From an etymological point of view, the concept of bureaucracy arises from the work carried out in the office space, which is a key feature mainly of public services. More generally, bureaucracy is called the system of structuring public authority. This system consists of the public services, the officials working in them, as well as the procedures which public bodies apply in order to carry out the programmes of the governments for which it is responsible. Bureaucracy emerged at a period when the national states appeared, which had to perform and carry out a number of functions, which were formerly carried out by other bodies, as for example landowners in the feudal system. Such functions resulted in the creation of organisms. In order for these organisations to be able to cope with their operation, they had to have workers with appropriate skills and expertise. This introduced the need for government agencies to be staffed by permanent, qualified and qualified employees. These needs led to the emergence of bureaucracy as a system that would solve the organisational and operational problems faced at that time by state agencies. Woodrow Wilson, who was the 28th President of the USA and the German sociologist Max Weber are the founders of the bureaucratic model (Sager, and Rosser, 2009).

Max Weber is considered to be the founder of the bureaucratic administration. His contribution to the organization of the administration was very important, since all modern management systems have been influenced by his perceptions. Weber developed the concept of bureaucracy, its characteristics and the facilities it provides to states in order to organize their functions. Weber (1919) stated that bureaucracy is the most rational solution to the needs of modern societies, as it ensures that the means used are appropriate to achieve social goals. Weber placed particular emphasis on the element of hierarchical dependence of the parties, as it ensures discipline, coherence of organisations and limits the framework of unnecessary actions. Wilson (1887) defined public administration as a detailed and systematic execution of public law and he divided government institutions into two separate sectors: administration and politics.

He thought the theory of public administration existed simply because of technicalities and was around for the behind the scenes business aspect of politics.

Both Weber and Wilson converged on similar principles of effective public administration. They pictured a formalized, professionalized, hierarchically organized, and meritocratic public administration and their works display at least a similar notion of the historical process which led to the emergence of public administration as the most effective form of government. However, Wilson placed more emphasis on organic growth. The bureaucratic model of administration was considered as the most effective and fair form of administration applied until then. Through this model several basic problems of previous models were tried to be solved, such as lack of impartiality, fairness, limited capacity, etc. The financial crises that occurred in the 1980s and 1990s in several European countries combined with the theory of 'economic rationality' greatly contributed to the intense questioning of the bureaucratic organisational system. On a practical level, the main disadvantage of bureaucracy was the difficulty of adapting it to changing social conditions. The gradual spread of technology and the leaps in communication and information were clearly very difficult to integrate into the existing system. Moreover, the inability of the model to function in the context of unforeseen developments, in the context of globalisation, the internet and modern technological systems, has led to further questioning of the bureaucratic model (Sager & Rosser, 2009).

Frederick Taylor was an American mechanical engineer, efficiency expert and management consultant. In 1911 he published the work «Principles of Scientific Management», in which he commissioned the process of scientific study of work to increase the efficiency of employees and organization. The principles underlying his theory contributed to a wide range of management practices during the 20th century, including specialisation of operations, assembly line production practices, labour analysis, work planning, incentive schemes, adaptation to workers' needs and production and control quotas (Giannantonio & Hurley-Hanson, 2011). Taylor's philosophy of management was a scientific approach to managerial decision making. Taylor believed that by optimizing and simplifying the tasks required by a job, productivity would be increased. He also stressed that there should be cooperation between employees and managers. This new approach was very different in terms of how a business operated until then. The approach of "Scientific Management" proposed by Taylor is based on the following four principles (Rimer, 1993):

1. Replacing working methods with methods based on the scientific study of the work.
2. Scientific selection, training and development of each worker so that his training is not empirical.

3. Working with workers to ensure that scientifically developed methods are followed.
4. Separating work almost identically between managers and employees, so that managers apply Scientific Management principles for project planning and employees perform tasks

Frederick Taylor's theory emphasizes efficiency, much like Max Weber's. However, according to Taylor, rather than scolding employees for every minor mistake, employers should reward workers for increased productivity.

Today, public administration has entered a new era, focusing more on results and making clear how important efficiency is in policy-making and decision-making in the modern forms of public administration. The ultimate goal of adopting modern forms of public administration - which include concepts such as Total Quality Management, Business Process Redesign and Learning Organization - is to improve efficiency and effectiveness in the public sector (Zervopoulos & Palaskas, 2010). Public administration is today undergoing a constant transformation, around the basic principle of serving the general interest, which appears as a "citizen-centered" administration in place of the bureaucracy. The call for modern participation puts employees in the public administration as protagonists, in a society of citizens and social partners characterized by the optimization of processes in the public sector. The concept of new public management appeared in the late 1970s and early 1980s in the United Kingdom, and was later adopted by the governments of New Zealand and Australia, successfully bringing major administrative reforms to the agenda of most of the countries that adopted it (Gruening, 2001). This concept enhances flexibility in the administrative system through participatory administration, being a counter-proposal to the most hierarchical and traditional models of public administration. New public management highlights the importance of extroverted orientation towards citizens with a view to improving the quality of the services provided, via the emphasis placed on the efficiency, effectiveness and cost-effectiveness of administrative actions (Rammata, 2011).

2.2 Digital transformation

Different theories are applied by several authors to capture the context of digital transformation, e.g., alignment view, configuration theory, resource-based view, dynamic capabilities, organizational learning theory, network view or business process reengineering (Nadkarni & Prügl, 2021). A very known model id that of Berman and Bell (2011), who support that a company's strategic approach to digital transformation typically follows one of the following three paths:

- Path 1: First, creation and integration of digital functions in the context of the reform of the company's operating model take place. Then, the firm redefines the value offer to the customer to achieve complete transformation
- Path 2: In this path, the firm improves, expands or reforms the value offer to the customer with digital content, insight and dedication. Then, integration of digital functions (reformation of the operating model of the enterprise) takes place.

- Path 3: A new set of features is created around the proposal to reform the offer of value to the customer and the reform of the operating model of the business (lock-in step).

The choice of the most suitable path for a business depends, according to Berman and Bell (2011), on the strategic objectives of the company, the industry in which it operates, the competitive pressures and the customer expectations.

An also known model is that of Westerman et al. (2011) (Digital Maturity Matrix) who orient four different types of approaches to driving digital transformation:

- Beginners
- Fashionistas
- Conservatives
- Digirati
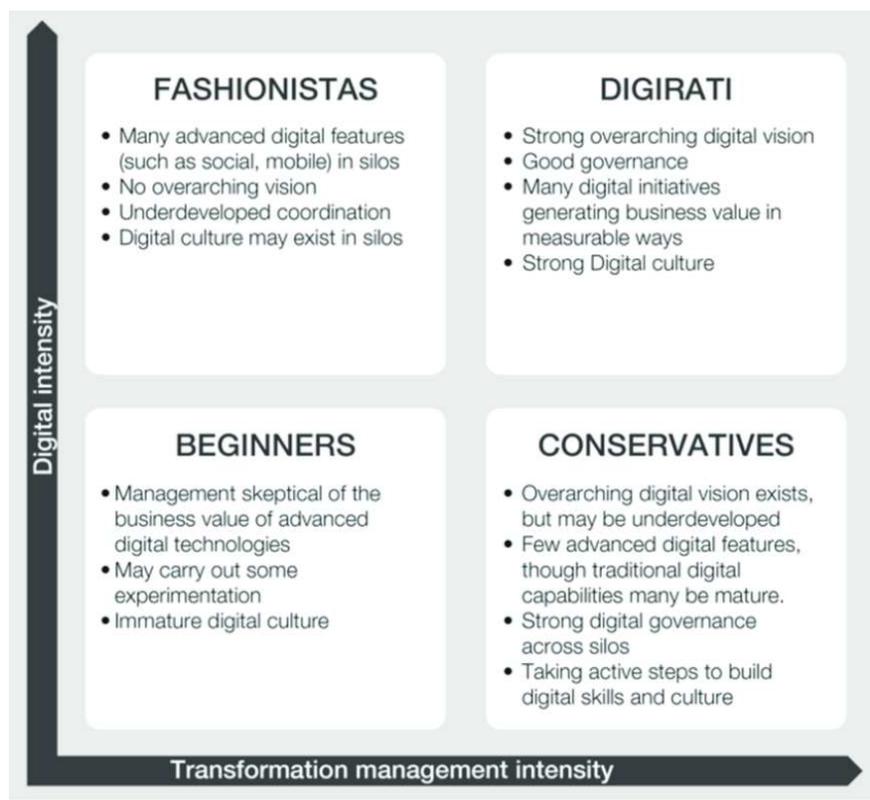
Figure 1 Digital Maturity Matrix

(Venier, 2017)

Another interesting model id proposed by Solis (2016) who argues that at the age of digital Darwinism - an age where technology and society are evolving faster than the ability of business to adapt naturally - every business is to a greater or lesser extent confronted with the effects of digital Darwinism. The six stage of digital business transformation that Solis (2016) proposed include:

- Business as Usual
- Present and Active
- Formalized
- Strategic
- Converged
- Innovative and Adaptive

Figure 2 The six stage of digital business transformation

(Solis, 2016)

Westerman et al. (2014) proposed a four-phase change management tool suitable for digital transformation projects – the Digital Transformation Compass (DTC). In recent years, research and approaches to managing change have been evolved, from the view of change as a causal linear process with a strictly defined starting and ending point, to a more circular, feedback-oriented concept, where each phase prepares the organisation for the transition to the next. In the past, the tendency of the agencies was to implement complex and time-consuming large-scale change projects that offered added value that would yield and last for many years to come. This is not the case today, as the disruption of established modes of operation (business, market, etc.) is happening at such a high rate that a change can be outdated very quickly. Therefore, organisations should adopt a culture of continuous change, supported by the respective processes and tools. In this area, change should be a continuous process and this is the basic principle that governs

the Digital Transformation Compass. The phases of the model are four and they include twelve core activities connected with best practices for digital transformation. The four phases are:

- Framing the Digital Challenge
- Focusing Investment
- Mobilizing the Organization
- Sustaining the Digital Transition

Figure 3 The Digital Transformation Compass

(Rigby, 2016)

2.3 Governmental digitalization

The study of the public administration digitalization problems and the introduction of digital technologies in the administrative practice of the bureaucracy is represented in a significant number of works by foreign scientists (Kosorukov, 2017). According to the literature, the theoretical foundation for comprehending the digital age, as well as the waves of digitalization of state administration, are considered in the works of Dunleavy and Hood (1994), Margetts and Dunleavy (2013), Fishenden and Thompson (2012) and others. Hallsworth (2016) analyses the place and role of digital technologies in modernizing the modern healthcare system, while others like Bertot, Estevez and Janowski (2016), Glick (2015), Hallsworth (2016), Janssen, Rana, Slade and Dwivedi

(2017) etc. emphasize the importance of digitalization of the production and consumption process state services. The study of open data and big data in the development of the digital era of the public administration is devoted to the researches of Margetts (2013), Card (2015), Aggarwal (2015), while Höchtl, Parycek and Schöllhammer (2016) and others emphasize the increasingly important role of big data in the process of making government decisions. As Barcevičius et al (2019) state, digital technologies that have been the basis of the recent governance, policy and process innovations across the World and in the EU include artificial intelligence, predictive analytics, robotics and automation, IoT, geo-spatial data, blockchain and open government data.

Digital transformation helps governments to change their mode of operation to improve public service delivery, be more efficient and effective in their designs, and achieve objectives such as increased transparency, interoperability, or citizen satisfaction. However, there is little systematic insight into the way that public administrators themselves are currently defining digital transformation in their own day-to-day practices, how they are approaching digital transformation projects, and what their expected outcomes are. Under this problematic, Mergel, Edelmannb and Haug (2019) interviewed 40 experts from 12 countries, mostly coming from Denmark, Spain, Italy, Austria, Germany and France, although single experts from Estonia, Belgium, US, Israel and Greece as well as from the European Commission were also included. Of the 40 experts, 29 came from government, six experts came from related sectors, five experts came from private organizations (mainly being IT service providers, having central roles in the digital transformation of the public sector). The majority of the experts were from higher or senior levels. The interview analysis showed that digital transformation is a process that is heavily influenced by external drivers, such as the use of new technologies by stakeholders of public administrations. While experts have a sense of what the potential end result of digital transformation might be, they are rarely able to highlight how a digitally transformed public administration might look like. This reveals that digital transformation is considered a process without an end status, unlike previously designed e-government projects with a start and an end date, a measurable and defined end status, as well as a fixed budget. Instead, digital transformation is a continuous process that needs frequent adjustments of its processes, services, and products to external needs. It will likely result in improved relationships between public administrations and its stakeholders, increased citizen satisfaction, and, most importantly, a change in bureaucratic and organizational culture.

Digital government utilizes information and communication technologies to support government functions, services, and citizens in their participation in social economic development, political processes and quality of living as a whole. However, most governments are far from capturing the full benefits of digitization (Huang and Karduck, 2017). According to the study of Liva et al (2020), the findings of their literature review on digital government transformation confirm that there are barriers and preconditions for a successful digital government transformation, which are

complex and often not technology related. Digital technologies can transform virtually every process, system and structure of government, making clear that moving from eGovernment to Digital Government transformation it is essential to start from the application of new emerging technologies and take into consideration their possible combination, as well as their specific characteristics.

Chapter 3. Digital Transformation: Greece

3.1 The Digital Transformation Paper 2020-2025

The Digital Transformation Paper is a record of the necessary interventions in the technological infrastructure of the Greek State, in the education and training of the population for the acquisition of digital skills as well as in the way our country utilizes digital technology in all sectors of the economy and public administration. Its main role is to describe the vision, philosophy and goals of the national strategy for the digital transformation of Greece. Today, more than 400 projects are classified into short- and medium-term, horizontal and sectoral, underlying the digital Greece strategy. Projects refer to all areas of public policy (e.g., Health, Education, Justice, Economy, Environment, Energy, etc.), contributing to the modernization of the operation of the public and private sector. A total of 145 project are on process right now (https://digitalstrategy.gov.gr/)

3.2 Projects

Many of the projects involved in the digital transformation of the State are horizontal, some of which are Catalysts, as their implementation is a prerequisite for the successful implementation of all the others. Other projects concern Digital Innovation and the Digital Transformation of Cities. As about Catalysts, these refer to the following (https://digitalstrategy.gov.gr/):

Open Data

- ✓ Formulation of the Data Governance Model at national level
- ✓ Design and implementation of the National Open Data Portal
- ✓ Content Mediator
- ✓ System for access of users and management of their personal data through gov.gr
- ✓ Creation of the Hellenic Metadata Register (EMDD)

Open Science

- ✓ Strengthen national infrastructure and digital research services
- ✓ Research software development and management
- ✓ Free disposal and reuse of research data produced from public funding
- ✓ Adoption of a National Open Science Strategy for Greece
- ✓ Open access to Research Infrastructures

Privacy and data protection

- ✓ Integrated Information system for managing requests of citizens, businesses, public services and other bodies through the Website of the Personal Data Protection Authority (APDPX)

- ✓ Formulation of an action plan in order for the Public Administration to handle personal data safely and in full compliance with the General Data Protection Regulation (GDPR) and the EU rules for privacy
- ✓ Provision of Technical Assistance to public bodies with the aim of their compliance with the European Regulation 2016/679 (GDPR), as it applies to Greek legislation Law 4624/2019

Strengthening accessibility

- ✓ Ensuring accessibility of digital solutions for people with disabilities
- ✓ Implementation of awareness actions and support of compliance to all Public Administration bodies
- ✓ Framing the compulsory and higher education level with programs both for the acquisition of the appropriate know-how for the design / programming of accessible websites and applications for mobile devices, as well as for the production of accessible digital documents
- ✓ Development of a digital registration platform for people with disabilities (National Register of People with Disabilities)

Open and participative government

- ✓ Update and enrich the Fourth National Action Plan for Open Government
- ✓ Design and implementation of a collaborative service design model for the implementation of digital services in the public sector
- ✓ Online cooperation platform for open government with the aim of ensuring the effective participation of all stakeholders in the design and implementation of open government interventions
- ✓ Implementation of the commitments included in the national action plans for open governance and co-shaping of the new national plan
- ✓ Integrating participatory governance practices and open technologies into the national education system

Interoperability

- ✓ Harmonization of the national interoperability framework with the current European one
- ✓ Formulation and institutionalization of an interoperability governance model
- ✓ Design and implementation of a European Knowledge Base
- ✓ Training of executives in the field of interoperability through the Interoperability Academy

With reference to Horizontal Projects, these are next listed:

- ✓ Implementation of a project of new ID cards
- ✓ Single Digital Map - Phase II
- ✓ National Reference Sets (Law 3882/2010)
- ✓ Digital Bank for Land Use

- ✓ Digitization of Diachronic Archive of Aerial Photo - Development and Provision of Services
- ✓ Digitization of Public Property
- ✓ Interoperability Register
- ✓ Upgrade of availability, backup, data security, hosted in the infrastructure of GSIS
- ✓ National Infrastructure for Citizen Authentication
- ✓ National Notification Service
- ✓ Central Government Software Licensing Agreement
- ✓ Register of Public Websites and Applications
- ✓ Central and Unified Fiscal Policy System (Government ERP)
- ✓ Central Human Resources Management System
- ✓ Payroll
- ✓ Expansion of Central Document Management System
- ✓ Codification and Reform of Greek Legislation
- ✓ Program DIAVGEIA
- ✓ National Public Procurement Database
- ✓ Redesign of the Central Electronic Register of Public Procurement (KIMDIS)
- ✓ Digital Transformation of Public Procurement
- ✓ Register of Contracting Authorities
- ✓ Redesign of the National Electronic Public Procurement System (ESIDIS)
- ✓ EShops and eMarketplaces in Public Procurement
- ✓ Design and implementation of a certification process for specialized information systems - bidding platforms in the field of Public Procurement
- ✓ Electronic invoicing, myDATA and cash register interface
- ✓ Implementation of a Data Analytics service support platform
- ✓ Integrated Citizen Relationship Management System
- ✓ Central system for receiving and managing proposals from citizens
- ✓ ICT action monitoring system
- ✓ Quality assurance in ICT implementation (QA)
- ✓ Digital Media Center
- ✓ Digitization of the General Archives of the State
- ✓ National Communication Register
- ✓ Central Electronic Document Handling System - Phase II
- ✓ Solemn Declaration/ Authorization
- ✓ Data Center Infrastructures EDYTE
- ✓ Know your Customer

The basic interventions of Digital Transformation Paper incorporate a series of actions and projects organized in distinctive strategic axes. This distinction was deemed appropriate on the basis of the nature and subject matter of the interventions, in order to clearly reflect the way in which the Digital Transformation Action Plan will be

implemented. Particular emphasis is placed on the evaluation of emerging technologies for the development of advanced solutions that will support the implementation of the goals of Digital Transformation. Axes refer to Connectivity, Cybersecurity, Public Infrastructure, Digital Skills, Digital State, Digital Business, Digital Innovation, Artificial Intelligence, as well as High Performance Computing Systems. The Digital Transformation affects Health, Education, Justice, Economy, etc. For each policy area, Sectoral Projects of Public Administration are recognized in order to digitally serve the citizen and businesses.

3.3 Cooperation Agreement with Estonia

The co-operation on digital transformation issues and the exchange of best practices between the Greek Ministry of Digital Government and the Estonian Ministry of Finance and Communications is also an important theme to state. The Agreement has been finalized, with the two sides signing a memorandum of understanding, according to a statement issued on 14th of July, 2021.

In particular, the two countries will set up working groups in the areas of modernizing public services, deepening transparency and enhancing digital skills for civil servants. In addition, the co-operation will focus on strategic planning on issues of electronic identification, digital health services, education and justice, as well as the fight against bureaucracy. For the implementation of the program, it was agreed to conduct presentations through teleconferences to public bodies in Greece, as well as to send relevant educational material. Furthermore, when the course of the pandemic allows it, face- to face cooperation between high-ranking officials from the two countries is envisaged (Banking News, 2021).

3.4 G-Cloud

An immaterial, invisible universe, the foundation of our smart world, is already transforming our lives. The cloud is the backbone of the Fourth Industrial Revolution.

The name cloud computing was inspired by the cloud symbol that's often used to represent the internet in flowcharts and diagrams. Cloud computing is a general term for anything that involves delivering hosted services over the internet. These services are divided into three main categories: infrastructure as a service (IaaS), platform as a service (PaaS) and software as a service (SaaS).

A cloud can be private, public or hybrid. A public cloud sells services to anyone on the internet. A private cloud is a proprietary network or a data center that supplies hosted services to a limited number of people, with certain access and permissions settings. A hybrid cloud is a combination of public cloud services and an on-premises private cloud, with orchestration and automation between the two. Companies can run mission-critical workloads or sensitive applications on the private cloud and use the public cloud to handle workload bursts or spikes in demand. Private, public or hybrid, the goal of cloud computing is to provide easy, scalable access to computing resources

and IT services. The cloud capacity is limitless; files and applications can be directly stored, processed and managed there, from any device – cellphone, tablet or computer.

The term "cloud" entered the consciousness of Greece's wider public with, first, the passage of the new law on digital governance, which mandates that, starting on January 1, 2022, all public agencies must gradually offer their services through the G-Cloud, and second, by Microsoft's announcement that it will build cloud server infrastructure in Greece, putting the country on the international digital map.

The G-Cloud aims at the sharing of computing infrastructures by the Public Administration Bodies, thus reducing the cost of their maintenance and support and increasing their degree of flexibility and security.

"*For the first time, the Greek State records in detail all its information infrastructures and at the same time proceeds to the installation of all central applications and information systems of the State in the central infrastructure of the Government Cloud (G-Cloud) of the General Secretariat for Public Health. And these procedures serve primarily the citizen but also the better functioning of the State itself, reducing bureaucracy and saving financial and human resources that can be directed to social or other services*", said the Minister of State and Digital Governance Kyriakos Pierrakakis. The process is expected to be completed by 1 January 2022.

The creation of central computing clouds (G-Cloud) is an international practice followed by states all over the world and fully serves the Interoperability of Public Bodies and Organizations. Typical examples are the United Kingdom, where over four years£ 340 million has been saved by fully implementing the "Cloud First Policy" policy, which prioritizes the consolidation and management of all information systems under single structures.

In Greece, significant economies of scale have been achieved in computing infrastructure and human resources, as well as reduced infrastructure maintenance costs. This is because maintenance and management are carried out centrally for the Greek State and not piecemeal by each institution. Based on international practices and studies, it is estimated that if each public sector body maintained a separate Data Center for its needs, the annual cost would be at least three times higher than what is achieved today with the concentration in the G-Cloud.

It is important to be mentioned that it has been also achieved better organization and coordination between public bodies in relation to information management and the enhancement of the security of information systems as well as the information they carry through the adoption of the international practice of data consolidation policy.

The General Secretary of Information Systems of Public Administration Demosthenes Anagnostopoulos noted: "*Both through the installation of public information systems in the central government cloud infrastructure (G-Cloud) of the GSCPD and through the new system of central procurement of software and equipment by the GSCPD, the*

Greek State "learns better itself" and drastically improves its infrastructure by utilizing the best international practices, like cloud first policy."

In total, G-Cloud currently hosts the applications and Information Systems of 206 public bodies. Having fully adopted the best international practices, G-Cloud is fully alert for new integrations. The investment strategy in G-Cloud includes several stages of upgrading and specialization, aiming at the concentration of all the Information Systems of the individual public administration bodies in a single structure under the maintenance and management of the infrastructure by the GSISD.

3.5 Implementation & Operation of G-Cloud Next Generation

A very important & in progress project is the G-Cloud Next Generation. The G-Cloud Next Generation (NxG) is the set of computing infrastructures that will be managed by the GSCPD to serve public administration systems. These infrastructures are computational resources that are physically installed in public data centers that are to be transformed and upgraded, or they are Digital Infrastructures of Public Cloud Computing. For its implementation (NxG) there will be an expansion of the existing computing power, as well as the addition of a second data center, the same capabilities in a different location (DR site).

At the same time, the procurement of computing infrastructures by public cloud providers will be carried out, forming a hybrid- own cloud computing system. This action will create specialized islands with different levels of services (SLAs) to meet special requirements for hosting systems and will shape policies and practices for the use of hospitality services by private entities as well, covering the existing needs of increased security, tolerance, as well as the possibility of recovery from disasters. Thus, the business continuity of the most critical information systems of public administration is covered, adopting architectural solutions such as that of the extended cluster with new more advanced services at the level of Infrastructure as a Service (IaaS), as well as Platform as a Service (PaaS) and Software as a Service (SaaS) services.

In addition, the GSCPD aims at the implementation of all new systems but at the gradual update of the existing ones, so that cloud native architectures follow. The consequence of the above will be the achievement of economies of scale and the exploitation of innovations in the field of data storage and automation during the implementation, deployment and operation process.

3.6 SYZEVXIS II

Later this year, another project from the list of approved ones is expected to be announced. This is the expansion and support of the National Telecommunications Network – Syzevxis II (telecommunications services in the public sector) with a budget

of 32.1 million euros. The project is already in the process of being implemented with various framework agreements already signed with selected companies.

The aim of SYZEVXIS II is to create the "telecommunications network" for the entire Greek State, in order to provide upgraded electronic communications services, such as telephony, internet, video, etc. at a reduced cost. It is essentially the evolution and expansion of the SYZEFXIS – SYZEFXIS I projects, which were implemented and supported on behalf of the Greek State by Information Information Development S.A., and includes the supply of all the necessary infrastructure as well as all the necessary telecommunications services.

The SYZEVXIS II project is the "core project" for the establishment of the Public Sector Network (SRT), as defined in Chapter I of Law 3979/2011 on e-Government. The main objectives of the SYZEVXIS II project are the following: a) to meet the telecommunications connection needs of public bodies (approximately 34,000 buildings), b) to upgrade the broadband of operators by utilizing optical access and ADSL and VDSL technologies, c) to upgrade the existing central services of the SYZEVXIS network, with emphasis on security, videoconferencing, teleworking and the use of mobile technologies by users. The project will utilize 68 Metropolitan Broadband Fiber Optic Networks (MAN) and through the aggregation of demand for public sector telecommunications services, it will achieve better utilization and drastic reduction of telecommunications costs.

3.7 Government ERP

The international open tender has already been published and, based on a relevant program agreement, the project, with a total budget of 51.522.000 euros, will be developed by the General Secretariat for Fiscal Policy of the Ministry of Finance and the General Secretariat for Information Systems of Public Administration (GGPSDDI) with the implementing body the Information Society M.A.E.

The implementation time of the project, which is one of the first to join and start under the Recovery Fund, is estimated at 48 months and will be an important tool for shaping the country's economic policy, as it will provide real-time accurate and reasonable representation of the financial situation of the Central Administration, but also of all the bodies of the General Government and their asset structure.

At the same time, it will enable recording of all public cash flows, at all stages of expenditure, acceleration of Central Administration payments, correct and immediate assessment of the country's creditworthiness, improvement of the procedures of preparation, execution and monitoring of the budget, convergence of the Plan with the Plan Accounts of Greek Accounting Standards and compatibility with other international financial classifications.

3.8 GOV.GR

The gov.gr is the new Single Digital Gateway of public administration for citizens and businesses. It hosts all the digital services of ministries, agencies, organizations and independent public authorities that are already provided via the internet. It also provides citizens directly with the new digital services of solemn declaration, authorization and intangible prescription, as well as every new digital service from now on.

The gov.gr is constantly evolving. In the first phase, it acts as a catalogue of electronic services. In its integrated form, it will be the digital service center that will gather everything you need for your transactions with the public sector. In other words, it will be the one and only point of contact between citizens and businesses and the public administration. Consequently, the implementation of the gov.gr aims to make it easier for the citizen and the trader to come into contact with all electronic services provided by the public sector with uniformity and security. Citizens and businesses are no longer the traffickers of documents on behalf of the state. They will have full access to any service, either from their computer or mobile phone through the gov.gr or in person from the Citizen Service Service Code of their neighborhood

3.9 Electronic Signature – Electronic Circulation of Documents

On 24-3-2020, the Ministry of Digital Governance in cooperation with the Presidency of the Government launched a platform for the digital signature and electronic circulation of cabinet documents. On 14-4-2020 for the first time a fully digitally signed draft law was submitted. The first digitally signed law is the 4681/27-03-2020.

The "General Secretariat for Digital Governance and Simplification of Procedures" in collaboration with the "General Secretariat for Information Systems of Public Administration" implements a "Central System of Electronic Circulation of Documents" known as KSDE, in the context of the implementation of Law 4727/2020 (Government Gazette 184 issue A 23-9-2020) on Digital Governance (Incorporation into Greek Legislation of Directive (EU) 2 016/2102 and Directive (EU) 2019/1024 – Electronic Communications and incorporation into Greek Law of Directive (EU) 2018/1972 and other provisions), which will be the central infrastructure for the exchange of electronic documents between all public bodies using approved digital signatures and is hosted in the G-Cloud of the GSCPD.

It is a horizontal digital solution that will contribute decisively to the full organization of correspondence between public bodies, the acceleration and transparency of administrative procedures, the reduction of bureaucracy and the saving of resources and time.

3.10   MyDesk Live

The "MyDesk Live" platform is a new vehicle for the service of the citizen that was designed by the General Secretariat for Information Systems of Public Administration of the Ministry of Digital Governance and utilizes the Interoperability Centre. The remote service of the citizen from the gov.gr through the myDesk Live service concerns digital appointments with public services, such as the IAPR, the Citizen Service Centers, OAED, embassies and consulates of our country. Since the beginning of the application's operation (summer 2020), more than 75,000 e-appointments of citizens and businesses with the services that have adopted the application so far have been made.

Calculating that if these appointments were made in a natural way and each citizen needed a total of one hour to go to and from the public service, it is obvious that 75,000 hours have been saved. The next steps are to integrate other bodies into the application, with the aim of facilitating the everyday life of citizens and saving time. It should be noted that the main benefit is the opportunity given to citizens with mobility problems and residents of remote areas to converse with public services without having to move and to be able to quickly and simply process their requests. Of particular importance is the application of remote contact with public bodies and in the era of the pandemic.

3.11   National Register of Communication

The National Register of Communication (N.T.M.E.) is the information system for the management of the central database of the only registration of the contact details of all natural persons to whom a Tax Identification Number (TIN) has been assigned. In the National Register of Communication, citizens will be able to enter their contact details, so that the Greek State bodies have the opportunity to communicate with them.

The benefits of registering contact details will be multiple for citizens, as they will be able to receive notifications (SMS messages on their mobile phone and / or e-mails) on issues that concern them in relation to public service, without it being necessary to fill in these data in each institution separately. In addition, through the National Register of Communication, the security of the citizen's transactions with public services is also enhanced, since a method of strong authentication of citizens is used in two ways:

-Use of personal codes for the services of the General Secretariat for Information Systems (GSIS).

-With the OTP (On Time Password) that will be sent via SMS to the mobile phone of the declared natural person.

3.12 egov- Know Your Customer

The service "Know Your Customer" offers a digital alternative to the presentation of public documents, for the certification of citizens' data to private sector bodies if required by law. The data are made available exclusively with the consent of the citizen, each time access is requested, in order to protect personal data along with the modern and valid availability of data collected from reliable sources. Initially the action will focus on banking institutions.

3.13 National Register of Procedures

The National Register of Procedures aims at recording, capturing and modelling the administrative procedures of the public sector. Citizens, businesses and civil servants, who through its use are expected to reap multiple benefits such as the extraction, from a single point of reference, of reliable and up-to-date information on the obligations and actions due, the relevant legislation, application forms, supporting documents and the steps of implementation of each administrative procedure of the state.

3.14 The Interoperability Centre

The Interoperability Centre was developed with the aim of interconnecting the electronic services of the State. That is, the scattered systems and registers which include citizens' data, often inaccurate or not in force. Through the Interoperability Centre, the data are updated and transmitted to the institution requesting them, without the need for the citizen to provide them. This avoids millions of citizens' movements from service to service and the waste of time and energy with all that this entails in working hours and costs, both for citizens and for the Greek State.

Chapter 4. Methodologies

4.1 Quantitative research methodology

The successful conduction of the research is determined through the careful selection of the proper methodology design. In specific, the methodology used at this dissertation to realize the data collection and conduct the research, will be presented in detail. The two factors the methodology design consist of, are not only the theoretical approach but also the questioning about it (Willig, 2001). The need of statistical analysis conduction which follows the identifying of the objectives of the research and the determination of the research questions constitute the basic goals of the researcher.

Firstly, it is worth mentioning that at the first subchapter, the goals of this research as well as the research questions are presented. After that, the methodological approach that was used in the research as well as the research tool are described in detail. Then, the population, sample, and sampling method are determined as well as the data collection process. Lastly, the processes the researcher followed so that reliability and validity to be ensured as well as the analysis method the researcher used are presented to fulfill the goals of this research.

4.1.1 Research questions of the research tool

The main purpose of the present research is to investigate the digital transformation of the Greek Public sector as far as evaluation and development strategies are concerned. In particular, from this analysis, the definition of the essential elements that are necessary for the digital transformation of the public administration will be investigated as well as the identification of difficulties and obstacles for Digital Transformation within the public administration of Greece will be realized. Lastly, as far as the Digital Maturity in Greek Public Administration is concerned, whether there are digital technologies used in the Greek public administration and the determination of them will be realized. Taking all the above into consideration, the research questions are the following:

- Which are the essential elements that are necessary for the digital transformation of the Greek public Administration?
- Which are the difficulties and obstacles for Digital Transformation within the Public Administration of Greece?
- Digital Maturity in Greek Public Administration: Are digital technologies used in the Greek public administration and which are they?

It is important to mention that to answer to the research questions, descriptive statistics methods were used by using frequency tables.

4.1.2 Methodological approach

Main goal of this research to be successful is to give meaningful answers to the research questions. Original and untreated (primary) data were derived directly from the examined characteristics (Clark-Carter,2004). According to Javeau (1996), there are two approaches in order the primary data to be collected fast and effectively. The first approach, which constitutes the qualitative approach, human behaviors and beliefs that focus on the nature of the of phenomena constitute the main subjects of a study. In contrast, according to qualitative approach, which is the most popular in social research, norms and trends that characterize an examined phenomenon are examined (Filias, 1996). One major advantage of this kind of approach for social studies is the provision of the capability of executing statistical analysis of primary data that are based on large sample sizes. These data can be collected by using research instruments or tools such as polls and questionnaires and enable the implementation of computational techniques (Willig, 2001). The statistical analysis can be executed with success giving the researcher the ability to seek to answer to research questions (Benos, 1991). In general, quantitative approaches are distinguished for their gullibility compared to qualitative (Iosifidis, 2008).

The qualitative data gathered, can be expressed as numerical quantities, and therefore, can be decoded. It is worth mentioning that computer software was used to analyze the data gathered from the research tool and data analysis was followed by discussion of the meaningful results regarding the study's research questions. The same research can also be repeated in the future by maintaining both high reliability and validity. In conclusion, quantitative research approach was the most appropriate approach for this study.

4.1.3 Research instrument

The selection of the proper research instrument is of major importance issue as it determines the process of data collection. At this dissertation, the research instrument of the questionnaire was selected as the most proper instrument tool (Appendix A). This research tool is distinguished for its many advantages as well as its popularity. The questionnaire can be very fast and effectively constructed as well as it can be distributed to many people with low cost (Oppenheim, 2000). Questionnaires serve well the main goal of the research which is to give meaningful results and answering to the research questions (Singh, 2007). Important characteristic that the questionnaires have is that they enable participants to answer to all the questions by their own, without the presence of the researcher. As a result, questionnaires are useful research tools as they encourage participants to express themselves and, in that way, to give honest answers.

The questionnaire of the specific research meets three important requirements that ensure its success. These requirements constitute clarity, completeness, and coherence (Dimitropoulos, 2004). In specific, this questionnaire is distinguished for its clear and understandable vocabulary so that every participant can understand the questions and

answer to all of them. In addition, sufficient instructions had been given by the researcher and all their queries had been answered. As far as the requirement of completeness is concerned, it is worth mentioning that all the aspects of the questionnaire aimed to investigate on the examined subject, are covered with complete success and in great detail (Creswell, 2011). Regarding the requirement of coherence, it is obvious that all the questions are posed from the researcher in a logical manner so that there will be no caution of any problems of confusion and misunderstanding from the participants' side (Javeau, 2000). As far as the questions and chapters are concerned, the present questionnaire consists of only closed type questions. According to these types of questions, participants have the ability to choose among specific possible answers the researcher has posed, the one that expresses them best. In general, the importance of the existence of closed type questions is severe as they help participants understand the questions quickly, creating in that way a feeling of comfortability while answering, enhancing their willingness to participate and giving honest answers in social research (Clark-Carter,2004).

Examining the questions of the present research tool, it consisted of five parts and 17 main questions. In specific, the first part had the title: "Demographics", the second part has the title: "Current national digital strategy for the digital transformation of the public administration", the third part had the title: "Difficulties and obstacles for Digital Transformation within the public administration of Greece", the fourth part had the title: "Essential elements for the digital transformation of the public administration" and the last part had the title: "Digital technologies used in the public administration".

At the first part of the questionnaire, the participants were asked to answer to five main questions: Question 1, Question 2, Question 3, Question 4, and Question 5. All the questions concern the demographic characteristics. Participants were kindly asked to answer about their gender, age, level of studies, number of years they have been working in the Greek Public sector and about their residential area.

At the second part of the questionnaire, the participants were kindly asked to answer to six main questions (Question 1, Question 2, Question 3, Question 4, Question 5, Question 6). Question 3 consisted of seven statements and Question 4 of seven statements too. All items of Question 3 and Question 4 were answered by choosing "Yes", "No", "I do not know". Question 4 and Question 5 were answered using a 10-point Likert scale format ranging from "Not at all" to "Extremely".

At the third part, the participants were kindly asked to answer to one main question with 10 statements. All items were answered using a 5-point Likert scale format ranging from "Very unimportant" to "Very important". The "Very unimportant" option takes 1 point, "Somewhat unimportant" takes 2 points, "Neutral" takes 3 points, "Somewhat Important" takes 4 points and "Very Important" takes 5 points.

At the fourth part, the participants were kindly asked to answer to one main question with seven statements. All items were answered using a 5-point Likert scale format ranging from "Not at all" to "Very much". The "Not at all" option takes 1 point, "not

very" takes 2 points, "Neutral" takes 3 points, "Somewhat" takes 4 points, and "Very much" takes 5 points.

At the last part of the questionnaire, the participants were kindly asked to answer to four main questions (Question 1, Question 2, Question 3, Question 4). Question 1 and Question 2 were answered using a 5-point Likert scale format ranging from "Not at all" to "Very much". The "Not at all" option takes 1 point, "not very" takes 2 points, "Neutral" takes 3 points, "Somewhat" takes 4 points, and "Very much" takes 5 points.

4.1.4 Population, sample and process

The population of the research consisted of employees who work in the public sector in the Greek territory. The sample of a research constitutes the subset of the population and is defined as the proportion of the population used to conduct the survey, having as a goal the potential to be as much representative as possible to the population (Filias, 1996). The sample consisted of 150 employees in the public sector who participated voluntary in the research, men and women over 22 years old.

In order to ensure quick and effective collection of data, the proper sampling method is especially important to be selected with carefulness. The simple random sampling method (Papageorgiou, 1998) constitutes a very popular method in social research and was used in the present research. This type of method has the characteristic that each member of the population has the same possibility to be chosen randomly as part of the sample (Dimitropoulos, 2004). According to the data collection process of this research, employees of the Greek public sector from all over Greece were chosen randomly to participate. In that way, less room for research bias was left (Iosifidis, 2003), characteristic that is very important for choosing this type of sampling method.

The collection of the data started by communicating with the employees and informing them in detail about the subject, goals and research questions as well as the importance of participating in this research. The communication was realized through e-mail, and they were given all the proper instructions. Furthermore, participants were informed about the anonymity of their answers, which is a very important ethical issue. Employees could have easily access to it through their mobile phone, tablet or laptop. Participants needed approximately 10-15 minutes to answer to the questions, participated voluntary and could leave from the research at any time. The collection of the answers lasted 30 days and specifically from 15 June 2021 to 15 July 2021.

4.1.5 Reliability and validity

The most important prerequisites in order the research to be successful and to give answers to the research questions constitute both reliability and validity of the research tool (Oppenheim, 2000). The validity of the research tool concerns its ability to measure what it is designed for, and the reliability is defined as the questionnaire's ability to be

answered under the same circumstances and by the same people after a long period (Singh, 2007). The research tool of the present dissertation appeared to be both reliable and valid as specific actions had been taken from the researcher to ensure this situation.

At this point, the actions that the researcher took to ensure reliability and validity will be described. Firstly, the research tool was designed so that the requirements of completeness, clarity and coherence that have been explained (as mentioned at Research instrument part) to be met. In addition, the participants were informed about the anonymity of their answers and the protection of their personal information so that they could feel free to express themselves better with honesty. Also, the absence of the researcher during answering the questions, enhanced the gathering of objective information as the researcher could not affect the answers. It is also important to mention that the fact that the participation in the research was voluntary, enhanced the selection of objective information too. Lastly, the fact that instructions and details about the goals, the research questions and the importance of executing this research were given to the participants ensured the existence of both prerequisites.

4.1.6 Data analysis

Statistical data analysis was conducted by using the statistical package of IBM S.P.S.S. (Statistical Package for the Social Sciences) Version 26 software for Windows. The answers were decoded so that they could easily be processed in the statistical package. Descriptive statistical analysis by using frequency tables and Pie charts were used to describe the demographics and frequency tables were used to answer to the research questions and fulfill the goal of this research.

4.1.7 Demographic characteristics

To start with, as far as gender is concerned, most of the employees of the Greek Public sector teachers were males at the percentage of 58% (87 out of 150 employees) while 42% were females (63 out of 150 employees) (Table 1, Graph 1).

Table 1. Frequency table of Gender

Gender	n	%
Male	87	58.0
Female	63	42.0
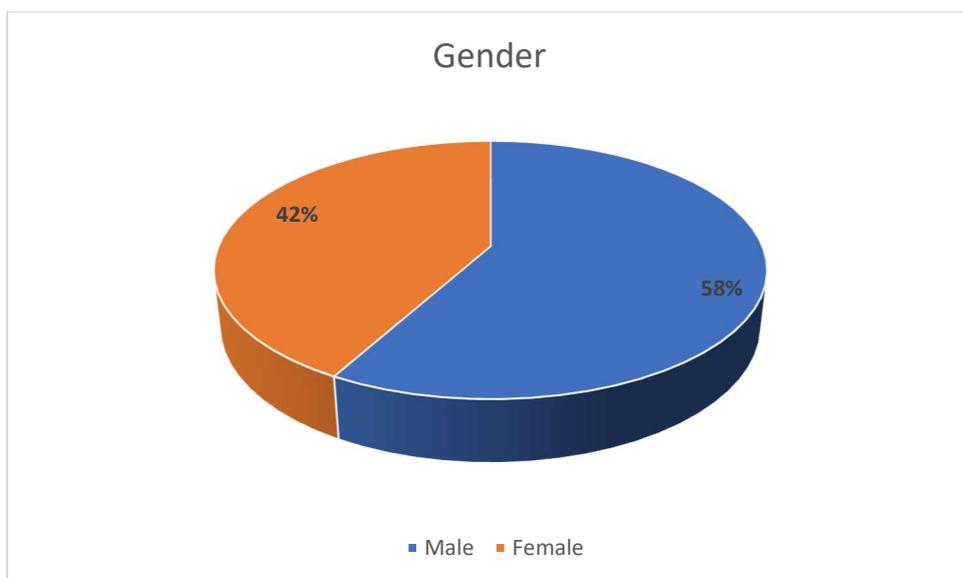
Graph 2. Pie chart of Gender

As far as the age of the participants is concerned, most of the employees of the Greek Public sector teachers were between 50 and 59 years old at the percentage of 34.6% (52 out of 150 employees), while only 7.3% were between 40 and 49 years old (11 out of 150 employees). In addition, 32% of the participants (48 out of 150 participants) were between 22 and 29 years old and 26% were more than 60 years old (39 out of 150 participants). The results are presented at Table 2 and Graph 2 that follow.

Table 3. Frequency table of Age

Age	n	%
22-29	48	32.0
30-39	0	0.0
40-49	11	7.3
50-59	52	34.6
60+	39	26.0
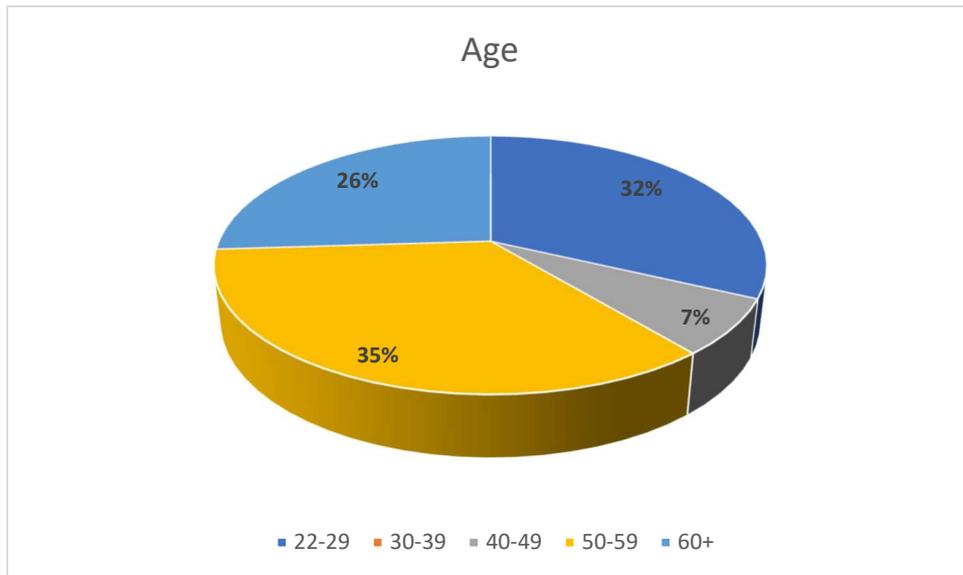
Graph 2. Pie chart of Age

As far as the level of education of the participants is concerned, most of the employees of the Greek Public sector (56 out of 150 employees or 37.3%) had Postgraduate studies, while only 0.7% (1 out of 150 employees) had Doctoral studies. Lastly, 28% of the employees (42 out of 150 employees) had Graduate studies. The results are presented at Table 3 and Graph 3 that follow.

Table 4. Frequency table of Level of studies

Level of studies	n	%
Graduate studies	42	28.0
Postgraduate studies	56	37.3
Doctoral studies	1	0.7
Other	51	34.0
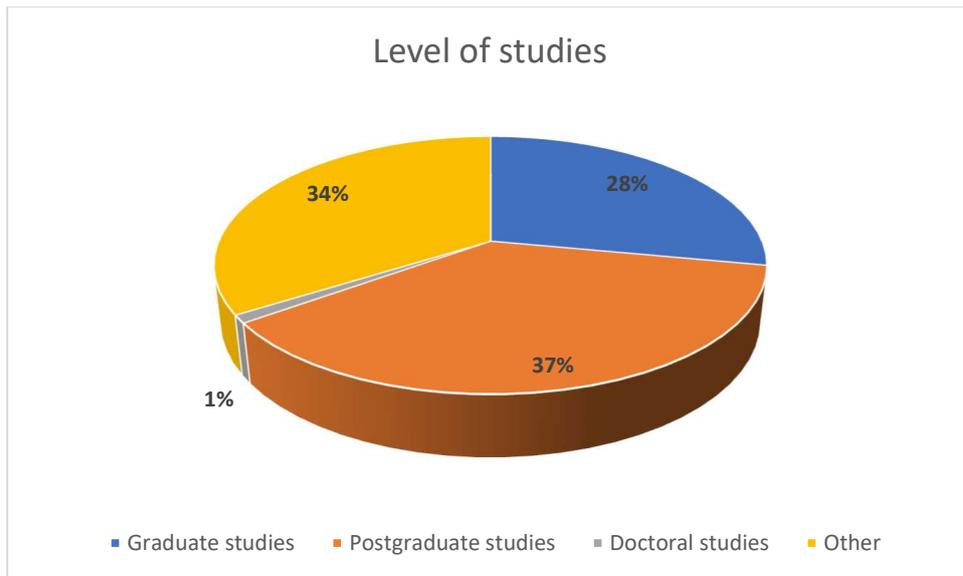
Graph 3. Pie chart of Level of studies

Regarding the working experience of the participants of the research, most of the employees (91 out of 150 participants or 60.7%) had more than 10 years, while only 7.3% (11 out of 150 participants) had between 6 and 10 years. In addition, 32% of the participants supported that they had less than one year of working experience in the Greek Public sector (48 out of 150 participants). These results are presented at Table 4 and Graph 4 that follow.

Table 5. Frequency table of Working experience in the Greek Public sector

Working experience in the Greek Public sector	n	%
Less than 1 year	48	32.0
1-5 years	0	0.0
6-10 years	11	7.3
10+ years	91	60.7
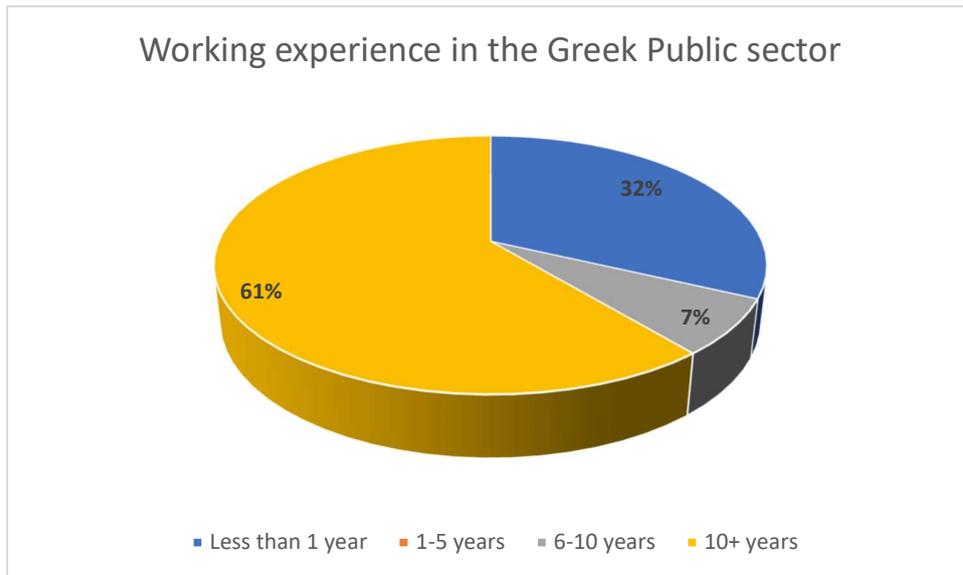
Graph 6. Pie chart of Working experience in the Greek Public sector

Lastly, most of the employees of the Greek Public sector who participated in the research, most of the employees (142 out of 150 participants or 94.7%) supported that their residential area is a city, while only 5.3% (8 out of 150 participants) supported that their residential area is an island (8 out of 150 participants). These results are presented at Table 5 and Graph 5 that follow.

Table 7. Frequency table of Working experience in the Greek Public sector

Residential area	n	%
City	142	94.7
Island	8	5.3
Village	0	0.0
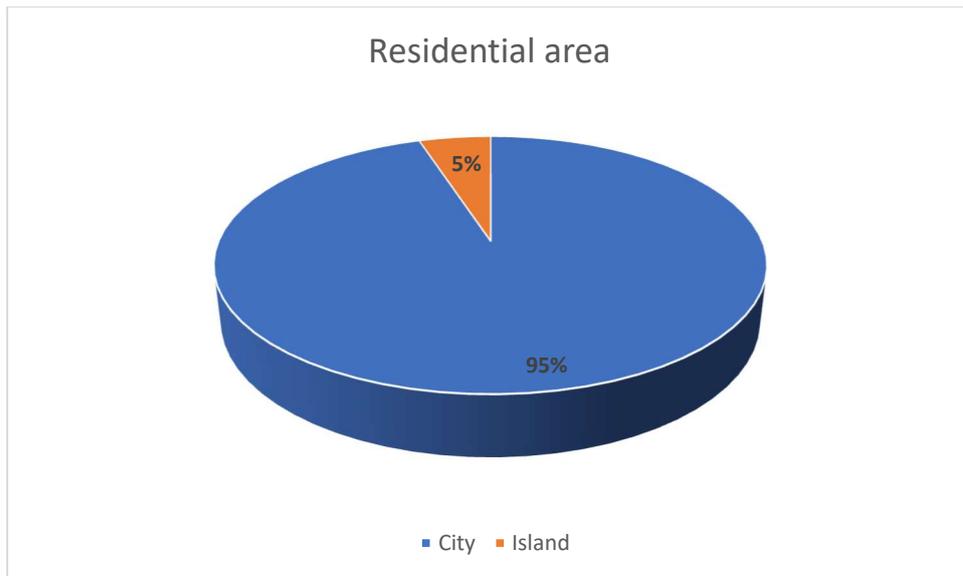
Graph 8. Pie chart of Working experience in the Greek Public sector

4.2 Qualitative research methodology

In this part, the qualitative research design is presented. Firstly, the concept of this research method is given, while next the methodological approach that was used is described. Information is given regarding the interview as the selected research tool and the case study. Next, the process of the data collection is described and the participants are listed. Lastly, reference is made on the ethics the researcher followed to fulfill the goals of this research.

4.2.1 Research method

The qualitative research method examines the characteristics of a phenomenon, motivations, behaviours and perceptions and its main element is in-depth analysis (Kyriazopoulos and Samanta, 2011). This type of research is appropriate for approaching a research problem in which social trends need to be identified. The choice of the qualitative method was based on the need to explore in depth and in more details the examined theme. The combination of qualitative and quantitative methods is applied in order to address the issue in a multifaceted manner.

4.2.2 Interview

Interview is a key tool of qualitative research. It is based on the communication that the researcher develops with the interviewee in order to obtain information and knowledge regarding the perceptions of the respondent, as well as opinions on the issues that have been raised. It is a tool that seeks to describe and interpret in depth certain phenomena (Kyriazopoulos and Samanta, 2011). There are three main types of interviews (Walliman, 2011):

• structured interview, which contains standard questions and the answers are closed.

• unstructured interview, which is a flexible format, usually based on a question guide, but the researcher can have flexibility in formulating the questions. There are no closed questions.

• semi-structured interview, which contains structured and unstructured sections with standard questions and open-ended questions.

Semi-structured interview was used as a research tool in the present study. All questions are open-ended, in order for the respondent to feel free to answer based on his or her own perceptions, through greater freedom of expression. The present study is based on "elite" interviews, which according to the literature, have as their main purpose the acquisition of information in depth, due to the specific purpose and the specificity of its investigation. This form of interview is a valuable tool in the social sciences and for its effective conduct it is important that the participant has the knowledge on the examined theme before starting the discussion (Hochschild, 2009).

Interviews have been divided into four different sections:

A. Interview to the EU:

1. What is the EU Digital Strategy for the digitalization of the public services?

2. How will progress of the EU member states be assessed and reviewed?

3. What projects related to the digitalization of the public services will the EU fund and in which manner? (Subsidies? Bond covered lending? Other type of lending?)

4. What are the benefits you expect EU citizens will get through the digitalization of the public sector?

5. How do you address the different states of maturity with regards digitalization of the various member states?

6. Is the pandemic a threat or rather an opportunity for digital transformation? Can improved digital governance in Greece be seen as one of the principal lasting consequences of the Covid-19 crisis? How can the Next Generation EU recovery package contribute to this strategic objective?

These questions are answered by the Directorate-General for Communications Networks, Content and Technology, which is part of the European Commission responsible for European Union policy in the areas of the digital single market, internet security and digital science and innovation.

B. Interview to the Greek Government:

1. What is the current national digital strategy for the digital transformation of the public administration?

2. What is the envisaged end state and what are the main levers that will push towards that direction (EU funding? PPP? State Funding? Venture Capitals?)

3.   What are the main obstacles & difficulties of digital transformation in the public sector, in your opinion?

4.   What are the most important opportunities for digital transformation in the public sector?

5.   What are the changes required in the regulatory framework in order for the Public Sectors' digital transformation to become effective?

6.   What are the next plans, for the acceleration of the digital transformation in the public sector in line with international good practices?

7.   Is the pandemic a threat or rather an opportunity for digital transformation?

Can improved digital governance in Greece be seen as one of the principal lasting consequences of the Covid-19 crisis? How can the Next Generation EU recovery package contribute to this strategic objective?

A representative of the Ministry of Digital Governance answered these questions.

   C. Interview to Greek Enterprises:

1.   What are the opportunities of Industry 4.0? How does the current innovation model of manufacturing in Greece need to change to take the opportunities?

2.   What is the most influential technology for digital transformation in the public sector to you?

3.   How can the digital governance project create new opportunities for Greek businesses?

4.   What are the changes required in the regulatory framework in order for the Public Sectors' digital transformation to become effective?

5.   How can local government leverage smart city technologies to stimulate new investments and economic development? What could central government be doing to assist local efforts?

6.   Is the pandemic a threat or rather an opportunity for digital transformation?

Can improved digital governance in Greece be seen as one of the principal lasting consequences of the Covid-19 crisis? How can the Next Generation EU recovery package contribute to this strategic objective?

   D. Interview to Greek Public Sector:

1.   What are the main obstacles & difficulties of digital transformation in the public sector, in your opinion?

2.   What are the benefits you expect citizens & businesses will get through the digitalization of the public sector?

3.   What are the next plans, for the acceleration of the digital transformation in your business?

4.   What is the envisaged end state and what are the main levers that will push towards that direction (EU funding? PPP? State Funding? Venture Capitals?)

5.   Is the pandemic a threat or rather an opportunity for digital transformation?

Can improved digital governance in Greece be seen as one of the principal lasting consequences of the Covid-19 crisis? How can the Next Generation EU recovery package contribute to this strategic objective?

4.2.3 Case study

The case study refers to the Fund of Archaeological Resources and Expropriations (TAP) which is a Legal Entity under Public Law (N.P.D.D.), supervised by the Ministry of Culture and Sports. Under the Law 4761/2020 it is renamed as Organization of Management and Development of Cultural Resources (ODAP), its structure is reorganized and its operation is modernized, in the context of the general effort of the contribution of the culture sector to the economic and social development of the country. The main development goals of ODAP are:

a) the upgrade of the quality of the services provided to the visitors of the archeological sites, monuments and museums,

b) the increase of the resources that come from the visits, the provision of services to the visitors, but also the utilization of real estate

(c) the allocation of these resources to support policies for the promotion and utilization of the public good of cultural heritage, as well as for the implementation of common policies and actions with contemporary culture (ODAP, 2020).

In the present part of the research, three questions were set to the participants:

1. What were the challenges of this project and how did you manage them?
2. What are the benefits that the organization will enjoy from the implementation of this project?
3. What do you think are the next steps/projects towards the digital transformation of the organization?

4.2.4 Research process

In the present thesis, the collection of data was done during the period from May 2021 to July 2021. Interviews were completed via email. Face to face contact was not permitted due to the pandemic. The initial communication was done via LinkedIn

platform. The duration of the interview was on average 40 minutes. A total of 10 interviews were answered in this research (Appendix B). The data selection was conducted by the method of deliberate sampling which is considered the most appropriate, because it allows to meet the specific needs of the study. The respondents were selected to be persons with special knowledge on the examined theme.

4.2.5 Participants

The respondents in this research were ten in number. One participant answered the interview representing the EU. One participant answered the interview representing the Greek Government. Two interviews referred to ODAP case study and the rest interviews were coming from Greek Enterprises and Greek Public Sector. All interviews make known the names and the position of the participants:

- Mr. Norbert Sagstetter, Head of Directorate-General for Communications Networks, Content and Technology, European Commission.
- Mr Aris Meletios, Head of the General Directorate of Informatics and Communications of Public Administration of the General Secretariat of Information Systems of the Ministry of Digital Government. He participates in important projects related to the modernization and Digital Transformation of Public Administration.
- Mr Ilias Apostolopoulos, Mayor of Papagos Municipality
- Mr Angelos Amditis, Research Director at ICCS, Chairman of ERTICO-ITS Europe, Deputy Chairman at OASA, Vice President of ITS Hellas, member of the ALICE Executive Group, member of EYDAP S.A. Board of Directors
- Mrs Georgia Botsika, Cluster General Manager Greece & Cyprus, Printec Enterprise.
- Mr Nikolaos Milonopoulos, Associate Professor of Digital Business at ALBA Graduate Business School.
- Mr Giannis Doxaras, Founder & CEO, Warply
- Mr Charis Apostolopoulos, Chief Transformation Officer PMO Global Alliance.
- Mrs P. Tasiogiannopoulou, Project Manager, ERP Galaxy/ POS Retail (ODAP)
- Mr Pantelis Tsironis, Project Manager for e-ticketing systems & access control (ODAP).

4.2.6 Research ethics

A research investigation must be conducted in accordance with the rules of ethics, ensuring that the execution of the research project is based on integrity and honesty. This requires clear guidelines and good cooperation with the people involved in the research, expressing respect for ethical issues at all phases: before, during and after the research. The individual values of the researcher regarding honesty and personal

integrity, as well as respect for the people involved in the research are of paramount importance (Walliman, 2011).

The present research was based on clear questions, without any elements of prejudice that could affect the respondent. Participants were informed about the objectives of the research, as well as about the possibility of refusing to participate. All information collected by participants remained confidential for satisfying the purposes of the current research only.

Chapter 5. Results

5.1 Questionnaire analysis

The statistical method of Descriptive statistics was used in order to answer to the research questions. To begin with, the opinions of the participants about the current national digital strategy for the digital transformation of the Greek public administration will be presented.

In particular, most of the participants at the percentage of 58% (87 out of 150 participants) supported that they do not know what the terminology of digital transformation is, while 42% of the participants (63 out of 150 in total) supported that they know what the terminology of digital transformation is. The results are presented at Table 6 that follows.

Table 9. Frequency table of Q1-Part II: " Do you know what the terminology of digital transformation is?"

Do you know what the terminology of digital transformation is?	n	%
Yes	63	42.0
No	87	58.0

It is important to mention that most of the participants at the percentage of 92.6% (139 out of 150 participants in total) supported that they do not believe that the digital transformation of the Greek public sector has been achieved to a significant extent, while 7.4% of the participants (11 out of 150 in total) supported that they believe that the digital transformation of the Greek public sector has been achieved to a significant extent. The results are presented at Table 7 that follows.

Table 10. Frequency table of Q2-Part II: " Do you believe that the digital transformation of the Greek public sector has been achieved to a significant extent?"

Do you believe that the digital transformation of the Greek public sector has been achieved to a significant extent?	n	%
Yes	11	7.4
No	139	92.6

At this point of the analysis, the beliefs of the participants about the tools that are required in the digital transformation of the Greek Public sector will be presented.

All the participants of the research (150 out of 150 participants in total) supported that they believe that the single Digital Portal / Digital services to citizens is required in the digital transformation of the Greek Public sector. These results are presented at Table 8 that follows.

Table 11. Frequency table of Q3.1-Part II: " Single Digital Portal / Digital Services to Citizens"

Which of the following do you believe is required in the digital transformation of the Greek Public sector? [Single Digital Portal / Digital Services to Citizens]	n	%
Yes	150	100.0
No	0	0.0
I do not know	0	0.0

Furthermore, most of the participants at the percentage of 91.3% (137 out of 150 participants in total) supported that they believe that the Identification Centre / Secure Communication for users is required in the digital transformation of the Greek Public sector, while 8.7% of the participants (13 out of 150 in total) were neutral. The results are presented at Table 9 that follows.

Table 12. Frequency table of Q3.2-Part II: " Identification Center / Secure Communication for Users"

Which of the following do you believe is required in the digital transformation of the Greek Public sector? [Identification Centre / Secure Communication for Users]	n	%
Yes	137	91.3
No	0	0.0
I do not know	13	8.7

Furthermore, most of the participants at the percentage of 68% (102 out of 150 participants in total) supported that they believe that Registers and Basic Registers are required in the digital transformation of the Greek Public sector, while 24% of the participants (36 out of 150 in total) supported that they do not support this opinion. In addition, 8% of the participants (12 out of 150 in total) were neutral. The results are presented at Table 10 that follows.

Table 13. Frequency table of Q3.3-Part II: " Registers and Basic Registers"

Which of the following do you believe is required in the digital transformation of the Greek Public sector? [Registers and Basic Registers]	n	%
Yes	102	68.0
No	36	24.0
I do not know	12	8.0

Moreover, most of the participants at the percentage of 65.3% (98 out of 150 participants in total) supported that they do not know if the existence of Interoperability Centre (Functional Interface Technical Centre) is required in the digital transformation of the Greek Public sector, while 34.7% of the participants (52 out of 150 in total) supported this tool is required in the digital transformation of the Greek Public sector. The results are presented at Table 11 that follows.

Table 14. Frequency table of Q3.4-Part II: " Interoperability Centre (Functional Interface Technical Centre)"

Which of the following do you believe is required in the digital transformation of the Greek Public sector? [Interoperability Centre (Functional Interface Technical Centre)]	n	%
Yes	52	34.7
No	0	0.0
I do not know	98	65.3

Most of the participants at the percentage of 56% (84 out of 150 participants in total) supported that they believe that Open Data on all services is required in the digital

transformation of the Greek Public sector, while 40.6% of the participants (61 out of 150 in total) supported this tool is not required in the digital transformation of the Greek Public sector. Also, 3.4% (5 out of 150 of the participants in total) supported that they do not know whether this tool is required in the digital transformation of the Greek Public sector. The results are presented at Table 12 that follows.

Table 15. Frequency table of Q3.5-Part II: " Open Data on all services"

Which of the following do you believe is required in the digital transformation of the Greek Public sector? [Open Data on all services]	n	%
Yes	84	56.0
No	61	40.6
I do not know	5	3.4

Most of the participants at the percentage of 75.3% (113 out of 150 participants in total) supported that they believe that Common Data Area (Data Repository) is required in the digital transformation of the Greek Public sector, while 13.3% of the participants (20 out of 150 in total) supported this tool is not required in the digital transformation of the Greek Public sector. Also, 11.4% (17 out of 150 of the participants in total) supported that they do not know whether this tool is required in the digital transformation of the Greek Public sector. The results are presented at Table 13 that follows.

Table 16. Frequency table of Q3.6-Part II: " Common Data Area (Data Repository)"

Which of the following do you believe is required in the digital transformation of the Greek Public sector? [Common Data Area (Data Repository)]	n	%
Yes	113	75.3
No	20	13.3
I do not know	17	11.4

It is a fact that most of the participants at the percentage of 80.7% (121 out of 150 participants in total) supported that they do not know whether Open Science is required in the digital transformation of the Greek Public sector, while 19.3% of the participants

(29 out of 150 in total) supported this tool is required in the digital transformation of the Greek Public sector. The results are presented at Table 14 that follows.

Table 17. Frequency table of Q3.7-Part II: "Open Science"

Which of the following do you believe is required in the digital transformation of the Greek Public sector? [Open Science]	n	%
Yes	29	19.3
No	0	0.0
I do not know	121	80.7

At this point of the analysis, the beliefs of the participants about the tools that are implemented in the digital transformation of the Greek Public sector will be presented

Most of the participants at the percentage of 60.7% (91 out of 150 participants in total) supported that they do not know whether the tool of Single Digital Portal / Digital Services to citizens is implemented in the digital transformation of the Greek Public sector, while 39.3% of the participants (59 out of 150 in total) supported this tool is implemented in the digital transformation of the Greek Public sector. The results are presented at Table 15 that follows.

Table 18. Frequency table of Q4.1-Part II: "Single Digital Portal / Digital Services to Citizens"

Which of the following do you believe that is implemented in the Greek Public Sector? [Single Digital Portal / Digital Services to Citizens]	n	%
Yes	59	39.3
No	0	0.0
I do not know	91	60.7

It is important to mention that most of the participants at the percentage of 55.3% (83 out of 150 participants in total) supported that they do not know whether the tool of Identification Centre / Secure Communication for users is implemented in the digital transformation of the Greek Public sector, while 44.7% of the participants (67 out of

150 in total) supported this tool is implemented in the digital transformation of the Greek Public sector. The results are presented at Table 16 that follows.

Table 19. Frequency table of Q4.2-Part II: "Identification Center / Secure Communication for Users"

Which of the following do you believe that is implemented in the Greek Public Sector? [Identification Centre / Secure Communication for Users]	n	%
Yes	67	44.7
No	0	0.0
I do not know	83	55.3

Most of the participants at the percentage of 48.7% (73 out of 150 participants in total) supported that Registers and Basic Registers are not implemented in the digital transformation of the Greek Public sector, while 24.7% of the participants (37 out of 150 in total) supported this tool is implemented in the digital transformation of the Greek Public sector. Also, 26.6% (40 out of 150 participants in total) supported that they do not know whether this tool is implemented in the Greek Public Sector. The results are presented at Table 17 that follows.

Table 20. Frequency table of Q4.3-Part II: "Registers and Basic Registers"

Which of the following do you believe that is implemented in the Greek Public Sector? [Registers and Basic Registers]	n	%
Yes	37	24.7
No	73	48.7
I do not know	40	26.6

Most of the participants at the percentage of 72.7% (109 out of 150 participants in total) supported that they do not know whether the existence of Interoperability Centre (Functional Interface Technical Centre) is implemented in the digital transformation of the Greek Public sector, while 27.3% of the participants (41 out of 150 in total)

supported this tool is not implemented in the digital transformation of the Greek Public sector. The results are presented at Table 18 that follows.

Table 21. Frequency table of Q4.4-Part II: "Interoperability Centre (Functional Interface Technical Centre)"

Which of the following do you believe that is implemented in the Greek Public Sector? [Interoperability Centre (Functional Interface Technical Centre)]	n	%
Yes	0	0.0
No	41	27.3
I do not know	109	72.7

Most of the participants at the percentage of 44% (66 out of 150 participants in total) supported that they do not know whether the tool of Open Data on all services is implemented in the digital transformation of the Greek Public sector, while 26.7% of the participants (40 out of 150 in total) supported this tool is implemented in the digital transformation of the Greek Public sector. Also, 29.3% (44 out of 150 in total) supported that this tool is not implemented in the digital transformation of the Greek Public sector. The results are presented at Table 19 that follows.

Table 22. Frequency table of Q4.5-Part II: "Open Data on all services"

Which of the following do you believe that is implemented in the Greek Public Sector? [Open Data on all services]	n	%
Yes	40	26.7
No	44	29.3
I do not know	66	44.0

In addition, most of the participants at the percentage of 43.3% (65 out of 150 participants in total) supported that Common Data Area (Data Repository) is implemented in the digital transformation of the Greek Public sector, while 19.3% of the participants (29 out of 150 in total) supported this tool is not implemented in the digital transformation of the Greek Public sector. Also, 37.4% (56 out of 150 in total)

supported that they do not know whether this tool is implemented in the digital transformation of the Greek Public sector. The results are presented at Table 20 that follows.

Table 23. Frequency table of Q4.6-Part II: "Common Data Area (Data Repository)"

Which of the following do you believe that is implemented in the Greek Public Sector? [Common Data Area (Data Repository)]	n	%
Yes	65	43.3
No	29	19.3
I do not know	56	37.4

Most of the participants at the percentage of 85.3% (128 out of 150 participants in total) supported that they do not know whether Open Science is implemented in the digital transformation of the Greek Public sector, while 14.7% of the participants (22 out of 150 in total) supported this tool is not implemented in the digital transformation of the Greek Public sector. The results are presented at Table 21 that follows.

Table 24. Frequency table of Q4.7-Part II: "Open Science"

Which of the following do you believe that is implemented in the Greek Public Sector? [Open Science]	n	%
Yes	0	0.0
No	22	14.7
I do not know	128	85.3

According to the employees of the Greek Public sector, the vast majority of them at the percentage of 94.6% (142 out of 150 participants in total) supported that the digital maturity of the Greece's public administration is from low to very low, while only 5.4% (8 out of 150 participants) supported that the digital maturity is quite low. The results are presented at Table 22 that follows.

Table 25. Frequency table of Q5-Part II: "On a scale of 1 to 10, where 1 corresponds to 10% and 10 to 100%, to what extent do you believe that the digital maturity of the Greece's public administration is?"

On a scale of 1 to 10, where 1 corresponds to 10% and 10 to 100%, to what extent do you believe that the digital maturity of the Greece's public administration is?	n	%
1	9	6.0
2	18	12.0
3	45	30.0
4	29	19.3
5	41	27.3
6	8	5.4
7	0	0.0
8	0	0.0
9	0	0.0
10	0	0.0

According to the employees of the Greek Public sector, the majority of them at the percentage of 80% (120 out of 150 participants in total) supported that digital maturity of the citizens in Greece is from low to very low, while only 20% (30 out of 150 participants) supported that the digital maturity of the citizens in Greece is quite low. The results are presented at Table 23 that follows.

Table 26. Frequency table of Q6-Part II: "On a scale of 1 to 10, where 1 corresponds to 10% and 10 to 100%, to what extent would you assess the digital maturity of the citizens in Greece?"

On a scale of 1 to 10, where 1 corresponds to 10% and 10 to 100%, to what extent would you assess the digital maturity of the citizens in Greece?	N	%
1	0	0.0
2	16	10.7
3	57	38.0
4	29	19.3
5	18	12.0
6	23	15.3
7	7	4.7
8	0	0.0
9	0	0.0
10	0	0.0

At this point of the Descriptive analysis, the opinion of the employees of the Greek public sector in Greece as far as the difficulties and obstacles for Digital Transformation within the public administration of Greece are concerned, will be presented.

In particular, most of the participants at the percentage of 62% (93 out of 150 participants in total) supported that the lack of High Technology is from a somewhat to a very important difficulty or obstacle in the digital transformation of the Greek Public administration, while 13.3% (23 out of 150 participants in total) supported that the Lack of technology is from a somewhat unimportant to a very unimportant obstacle. Also, 22.7% of the employees (34 out of 150 in total) were neutral. The results are presented at Table 24 that follows.

Table 27. Frequency table of Q1.1-Part III: "Lack of High Technology"

How important do you think are the following difficulties or obstacles in the digital transformation of the Greek Public administration [Lack of High Technology]	n	%
Very unimportant	12	8.0
Somewhat unimportant	11	7.3
Neutral	34	22.7
Somewhat Important	52	34.7
Very Important	41	27.3

In addition, most of the participants at the percentage of 92% (138 out of 150 participants in total) supported that the lack of connectivity infrastructure is a very important difficulty or obstacle in the digital transformation of the Greek Public administration, and 8% (12 out of 150 participants in total) supported that the connectivity infrastructure is a somewhat important obstacle. The results are presented at Table 25 that follows.

Table 28. Frequency table of Q1.2-Part III: "Connectivity Infrastructure"

How important do you think are the following difficulties or obstacles in the digital transformation of the Greek Public administration [Connectivity Infrastructure]	n	%
Very unimportant	0	0.0
Somewhat unimportant	0	0.0
Neutral	0	0.0
Somewhat Important	12	8.0
Very Important	138	92.0

Most of the participants at the percentage of 49.3% (74 out of 150 participants in total) supported that digital Skills of Employees in Public Administration are from somewhat

to very important difficulties or obstacles in the digital transformation of the Greek Public administration, while 26% (30 out of 150 participants in total) supported that the digital skills of employees in Public Administration are from somewhat unimportant to very unimportant obstacles. Also, 30.7% of the employees (46 out of 150 in total) were neutral. The results are presented at Table 26 that follows.

Table 29. Frequency table of Q1.3-Part III: "Digital Skills of Employees in Public Administration"

How important do you think are the following difficulties or obstacles in the digital transformation of the Greek Public administration [Digital Skills of Employees in Public Administration]	n	%
Very unimportant	1	6.7
Somewhat unimportant	29	19.3
Neutral	46	30.7
Somewhat Important	71	47.3
Very Important	3	2.0

Most of the participants at the percentage of 68.7% (103 out of 150 participants in total) supported that the regulatory framework of the employees in Greek Public Administration is from a somewhat to a very important difficulty or obstacle in the digital transformation of the Greek Public administration, while 8.6% (13 out of 150 participants in total) supported that the regulatory framework of employees in Greek Public Administration is from a somewhat unimportant to a very unimportant obstacle. Also, 22.7% of the employees (34 out of 150 in total) were neutral. The results are presented at Table 27 that follows.

Table 30. Frequency table of Q1.4-Part III: "Regulatory Framework"

How important do you think are the following difficulties or obstacles in the digital transformation of the Greek Public administration [Regulatory Framework]	n	%
Very unimportant	2	1.3
Somewhat unimportant	11	7.3
Neutral	34	22.7
Somewhat Important	85	56.7
Very Important	18	12.0

Furthermore, most of the participants at the percentage of 35.3% (53 out of 150 participants in total) supported that Policies are from somewhat to very important difficulties or obstacles in the digital transformation of the Greek Public administration, while 30% (45 out of 150 participants in total) supported that Policies are from somewhat unimportant to very unimportant obstacles. Also, 34.7% of the employees (52 out of 150 in total) were neutral. The results are presented at Table 28 that follows.

Table 31. Frequency table of Q1.5-Part III: "Policies"

How important do you think are the following difficulties or obstacles in the digital transformation of the Greek Public administration [Policies]	n	%
Very unimportant	11	7.3
Somewhat unimportant	34	22.7
Neutral	52	34.7
Somewhat Important	48	32.0
Very Important	5	3.3

Furthermore, most of the participants at the percentage of 69.2% (104 out of 150 participants in total) supported that infrastructures are from somewhat to very important

difficulties or obstacles in the digital transformation of the Greek Public administration, while 6% (9 out of 150 participants in total) supported that infrastructures are somewhat unimportant obstacles. Also, 24.7% of the employees (37 out of 150 in total) were neutral. The results are presented at Table 29 that follows.

Table 32. Frequency table of Q1.6-Part III: "Infrastructures"

How important do you think are the following difficulties or obstacles in the digital transformation of the Greek Public administration [Infrastructures]	n	%
Very unimportant	0	0.0
Somewhat unimportant	9	6.0
Neutral	37	24.7
Somewhat Important	76	50.9
Very Important	28	18.3

In addition, most of the participants at the percentage of 56% (84 out of 150 participants in total) supported that digital skills of the population are from a somewhat to very important difficulties or obstacles in the digital transformation of the Greek Public administration, while 30.7% (46 out of 150 participants in total) supported that digital skills of the population are from somewhat unimportant to very unimportant obstacles. Also, 13.3% of the employees (20 out of 150 in total) were neutral. The results are presented at Table 30 that follows.

Table 33. Frequency table of Q1.7-Part III: "Digital Skills of the Population"

How important do you think are the following difficulties or obstacles in the digital transformation of the Greek Public administration [Digital Skills of the Population]	n	%
Very unimportant	29	19.4
Somewhat unimportant	17	11.3
Neutral	20	13.3

Somewhat Important	38	25.3
Very Important	46	30.7

Most of the participants at the percentage of 90% (135 out of 150 participants in total) supported that the lack of financial resources is from a somewhat to a very important difficulty or obstacle in the digital transformation of the Greek Public administration, while 10% (15 out of 150 participants in total) were neutral. The results are presented at Table 31 that follows.

Table 34. Frequency table of Q1.8-Part III: "Lack of financial resources"

How important do you think are the following difficulties or obstacles in the digital transformation of the Greek Public administration [Lack of financial resources]	n	%
Very unimportant	0	0.0
Somewhat unimportant	0	0.0
Neutral	15	10.0
Somewhat Important	28	18.7
Very Important	107	71.3

Furthermore, most of the participants at the percentage of 66% (99 out of 150 participants in total) supported that the ageing Population of the country is from a somewhat to a very unimportant difficulty or obstacle in the digital transformation of the Greek Public administration, while 15.3% (23 out of 150 participants in total) supported that the ageing Population of the country is from a somewhat important to a very important obstacle. Also, 18.7% of the employees (28 out of 150 in total) were neutral. The results are presented at Table 32 that follows.

Table 35. Frequency table of Q1.9-Part III: "Ageing Population of the country"

How important do you think are the following difficulties or obstacles in the digital transformation of the Greek Public administration [Ageing Population of the country]	n	%
Very unimportant	53	35.3
Somewhat unimportant	46	30.7
Neutral	28	18.7
Somewhat Important	15	10.0
Very Important	8	5.3

It is a fact that most of the participants at the percentage of 50.7% (76 out of 150 participants in total) were neutral about whether the lack of accessibility to new technologies of the population (high costs, remote areas, etc.) is an important difficulty or obstacle in the digital transformation of the Greek Public administration, while 21.3% (32 out of 150 participants in total) supported that the lack of accessibility to new technologies is from a somewhat unimportant to a very unimportant obstacle. Also, 28% of the employees (42 out of 150 in total) supported that the lack of the observed accessibility is from a somewhat important to a very important obstacle. The results are presented at Table 33 that follows.

Table 36. Frequency table of Q1.10-Part III: "Lack of accessibility to new technologies of the population (high costs, remote areas, etc.)"

How important do you think are the following difficulties or obstacles in the digital transformation of the Greek Public administration [Lack of accessibility to new technologies of the population (high costs, remote areas, etc.)]	n	%
Very unimportant	8	5.3
Somewhat unimportant	24	16.0
Neutral	76	50.7

Somewhat Important	31	20.7
Very Important	11	7.3

The employees of the Greek public sector expressed their opinion about the essential elements for the digital transformation of the public administration too.

In particular, most of the participants at the percentage of 87.3% (131 out of 150 participants in total) supported that the knowledge and implementation of High Technology is necessary for the digital transformation of the Public Administration in Greece from somewhat to very much, while 12.7% (19 out of 150 participants in total) were neutral. The results are presented at Table 34 that follows.

Table 37. Frequency table of Q1.1-Part IV: "Knowledge and implementation of High Technology"

To what extent do you think each element of the following is necessary for the digital transformation of the Public Administration in Greece? [Knowledge and implementation of High Technology]	n	%
Not at all	0	0.0
Not very	0	0.0
Neutral	19	12.7
Somewhat	34	22.7
Very much	97	64.6

It is important to mention that most of the participants at the percentage of 42% (63 out of 150 participants in total) were neutral about whether advanced digital skills of the Population are necessary for the digital transformation of the Public Administration in Greece, while 17.4% (26 out of 150 participants in total) supported that this element is from not very to not at all necessary. Also, a high percentage of the participants (61 out of 150 in total or 41%) supported that the advanced digital skills of the population are somewhat to very much necessary for the digital transformation of the Public Administration in Greece. The results are presented at Table 35 that follows.

[65]

Table 38. Frequency table of Q1.2-Part IV: "Advanced digital Skills of the Population"

To what extent do you think each element of the following is necessary for the digital transformation of the Public Administration in Greece? [Advanced digital Skills of the Population]	n	%
Not at all	7	4.7
Not very	19	12.7
Neutral	63	42.0
Somewhat	56	37.3
Very much	5	3.3

Most of the participants at the percentage of 90% (135 out of 150 participants in total) supported that advanced digital skills of Employees in Public Administration are from somewhat to very much necessary for the digital transformation of the Public Administration in Greece, while 4% (6 out of 150 participants in total) were neutral. Also, 6% of the participants (9 out of 150 in total) supported that the advanced digital skills are not very necessary. The results are presented at Table 36 that follows.

Table 39. Frequency table of Q1.3-Part IV: "Advanced digital Skills of Employees in Public Administration"

To what extent do you think each element of the following is necessary for the digital transformation of the Public Administration in Greece? [Advanced digital Skills of Employees in Public Administration]	n	%
Not at all	0	0.0
Not very	9	6.0
Neutral	6	4.0
Somewhat	43	28.7

Very much	92	61.3

Furthermore, most of the participants at the percentage of 78.7% (118 out of 150 participants in total) supported that the regulatory framework is from somewhat to very much necessary for the digital transformation of the Public Administration in Greece, while 21.3% (32 out of 150 participants in total) were neutral. The results are presented at Table 37 that follows.

Table 40. Frequency table of Q1.4-Part IV: "Regulatory Framework"

To what extent do you think each element of the following is necessary for the digital transformation of the Public Administration in Greece? [Regulatory Framework]	n	%
Not at all	0	0.0
Not very	0	0.0
Neutral	32	21.3
Somewhat	107	71.4
Very much	11	7.3

It is important to mention that most of the participants at the percentage of 58% (87 out of 150 participants in total) were neutral about whether effective policies are necessary for the digital transformation of the Public Administration in Greece, while 4.7% (7 out of 150 participants in total) supported that effective policies are not very necessary. Also, 37.3% of the participants (56 out of 150 in total) supported that effective policies are somewhat necessary for the digital transformation of the Public Administration in Greece. The results are presented at Table 38 that follows.

Table 41. Frequency table of Q1.5-Part IV: "Effective policies"

To what extent do you think each element of the following is necessary for the digital transformation of the Public Administration in Greece? [Effective policies]	n	%
Not at all	0	0.0
Not very	7	4.7
Neutral	87	58.0
Somewhat	56	37.3
Very much	0	0.0

Most of the participants at the percentage of 95.3% (143 out of 150 participants in total) supported very much that the financial resources are necessary for the digital transformation of the Public Administration in Greece, and 4.7% (7 out of 150 participants in total) supported that this element is somewhat necessary. The results are presented at Table 39 that follows.

Table 42. Frequency table of Q1.6-Part IV: "Financial Resources"

To what extent do you think each element of the following is necessary for the digital transformation of the Public Administration in Greece? [Financial Resources]	n	%
Not at all	0	0.0
Not very	0	0.0
Neutral	0	0.0
Somewhat	7	4.7
Very much	143	95.3

Most of the participants at the percentage of 68.7% (103 out of 150 participants in total) were neutral about whether the equal population accessibility to new technologies is necessary for the digital transformation of the Public Administration in Greece, while

6.7% (10 out of 150 participants in total) supported that this element is somewhat necessary. Also, 24.6% (37 out of 150 participants in total) supported that this element is from not very to not at all necessary. The results are presented at Table 40 that follows.

Table 43. Frequency table of Q1.7-Part IV: "Equal population accessibility to new technologies"

To what extent do you think each element of the following is necessary for the digital transformation of the Public Administration in Greece? [Equal population accessibility to new technologies]	n	%
Not at all	8	5.3
Not very	29	19.3
Neutral	103	68.7
Somewhat	10	6.7
Very much	0	0.0

It is worth mentioning that most of the participants at the percentage of 91.3% (137 out of 150 participants in total) supported that they had not been working remotely at all through laptop or other digital device (for instance work from home) before lockdown. Also, 8.7% (13 out of 150 participants in total) supported that had not been working much remotely before lockdown. The results are presented at Table 41 that follows.

Table 44. Frequency table of Q1-Part V: "At which level had you been working remotely through laptop or other digital device (for instance work from home) before lockdown?"

At which level had you been working remotely through laptop or other digital device (for instance work from home) before lockdown?	n	%
Not at all	137	91.3
Not very	13	8.7

Neutral	0	0.0
Somewhat	0	0.0
Very much	0	0.0

In addition, most of the participants at the percentage of 94% (141 out of 150 participants in total) supported that they have replaced physical documents with digital files at their work from not very to not at all. Also, 6% (9 out of 150 participants in total) were neutral. The results are presented at Table 42 that follows.

Table 45. Frequency table of Q2-Part V: "At which level have you replaced physical documents with digital files at your work?"

At which level have you replaced physical documents with digital files at your work?	n	%
Not at all	76	50.7
Not very	65	43.3
Neutral	9	6.0
Somewhat	0	0.0
Very much	0	0.0

The employees of the Greek public sector believe that many kinds of digital technologies should be implemented in the public sector. Firstly, all employees supported that the Website should be implemented. Additionally, 96% (144 out of 150 in total) supported the Enterprise Resource Planning (ERP) system, 94% (141 out of 150 in total) supported the E-learning platform, 91.3% (137 out of 150 in total) supported Cybersecurity, 85.3% (128 out of 150 in total) supported Ticketing system, 72% (108 out of 150 in total) supported Social media platforms and 61.3% (92 out of 150 in total) supported Customer Relationship Management (CRM) system. With lower percentages employees supported E-shop (82 out of 150 in total or 54.7%), Human Resources Management and Information system (HRMS) (74 out of 150 in total or 49.3%), Cloud Computing & services (60 out of 150 in total or 40%), Big Data Analytics (40 out of 150 in total or 26.7%) and Evaluation system (32 out of 150 in total or 21.3%). The results are presented at Table 43 that follows.

Table 46. Frequency table of Q3-Part V: "Which kind of digital technologies do you believe that should be implemented in the public sector? (you can choose more than one answer)"

Which kind of digital technologies do you believe that should be implemented in the public sector?	n	%
Customer Relationship Management (CRM) system	92	61.3
Enterprise Resource Planning (ERP) system	144	96.0
Human Resources Management and Information system (HRMS)	74	49.3
Ticketing system	128	85.3
Evaluation system	32	21.3
Big Data Analytics	40	26.7
E-learning platform	141	94.0
Internal Chat	93	62.0
Website	150	100.0
Social media platforms	108	72.0
E-shop	82	54.7
Cloud Computing & services	60	40.0
Cybersecurity	137	91.3
Other	0	0.0

Lastly, according to Table 44, employees of the Greek public sector supported that they use Customer service through email (131 out of 150 in total or 87.3%) and Website (89 out of 150 in total or 59.3%) most. They also use mobile applications with lower percentage (23 out of 150 in total or 15.3%).

Table 47. Frequency table of Q4-Part V: "Please determine the digital channels/contact points you use most to interact with your customers (you can choose more than one answer)"

Please determine the digital channels/contact points you use most to interact with your customers.	n	%
Website	89	59.3
Customer service through email	131	87.3
Social media platform	0	0.0
Video calls	0	0.0
Chat	0	0.0
Mobile applications	23	15.3
Other	0	0.0

5.2 Interview analysis – Case Study

5.2.1 Interview to the EU

As about the first question, Mr Norbert Sagstetter referred to the EU Digital Strategy for the digitalization of the public services. She stated the importance of Commission's vision on digital transformation by 2030.

"*The ambition of the European Commission is more relevant than ever: to pursue digital policies that empower people and businesses to seize a human centred, sustainable and more prosperous digital future.... By 2030, the objective is to have:*

- *100% online provision of key public services available for European citizens and businesses*
- *100% of European citizens have access to medical records (e-records)*
- *80% of citizens will use a digital ID solution*".

Europe's Digital Decade sets the benefits of digital solutions to connect, explore, work and fulfil one's ambitions, online as offline, highlighting the advantages of digitalisation for all citizens.

Passing to the second question, Mr Norbert Sagstetter mentioned how will progress of the EU member states be assessed and reviewed.

"The European Commission monitors the progress of EU Member States through two main indexes:

1) The Digital Economy and Society Index (DESI (Connectivity, Human Capital, Use of Internet, Integration of digital technology, Digital public services: e-Government)

2) E-Government Benchmark (User Centricity, Transparency, Key Enablers, Cross-Border Mobility)".

Next, Mr Norbert Sagstetter was referred to the projects related to the digitalization of the public services will the EU fund:

- The Recovery and Resilience Facility (RRF)
- The Technical Support Instrument (TSI)
- Horizon 2020
- The Digital Europe Programme (DIGITAL)
- Horizon Europe
- Connecting Europe Facility (CEF)
- European Regional Development Fund

With reference to the benefits EU citizens will get through the digitalization of the public sector, she mentioned:

"1) Improved administrative efficiency, reduction of administrative burden and better coordinated programs/services

2) Improved administrative processes, government capabilities, and professionalism

3) Improved decision making and data quality in the public sector

4) Improved user experience, trust and confidence in government

5) Improved inclusiveness of public services

6) Human-centric, inclusive, personalized, easy-to-use, interoperable, responsive, secure, cross-border, reliable and pro-active digital public services"

Next, Mr Norbert Sagstetter addressed the different states of maturity with regards digitalization of the various member states.

"Member States share experiences and best practices on digital government in the eGovernment Action Plan Steering Board. In addition, the Steering Board members cooperate on a number of topics that are of particular interest to them, such as artificial intelligence, data analytics and personal data management. Inequalities in maturity with regards to digitalization could be addressed in EU programmes, such as the ERDF and TSI. The yearly eGovernment Benchmark and DESI indicators allow Member States to be informed about their progress and performance in relation to other Member States and the EU average".

In the final question, Mr Norbert Sagstetter made reference to the pandemic and to the digital governance in Greece.

"*Under the Covid-19 pandemic, public administrations across all Member States had to increase the number of digital services available for citizens and developments. These developments can be seen in the light of benefits, but also the threats/vulnerabilities they pose for public administrations...During the Covid-19 pandemic, Greece was among the countries that progressed significantly in advancing their digital agenda and making online public services available for citizens and businesses...Greece has proved commitment and embraced innovative solutions based on cloud and mobile apps to digitalize public services. Greece is also showing keen interest to grasp the opportunities offered by the Recovery and Resilience Facility (RRF) and invest further in the digitalization of public administration...The Greek plan is showing a clear vision for a digitally advanced and innovative future by leveraging on successful developments, such as interoperability, use of novel technologies (cloud, AI, data), digital skills of public servants and the digitalisation of local administrations*.*"

5.2.2 Interview to the Greek Government

Mr Meletios firstly mentioned the current national digital strategy for the digital transformation of the public administration. He addressed that Greece's strategy for the digital transformation of the public sector has been defined, approved and reflected in the updated "Digital Transformation Paper 2020-2025" (https://digitalstrategy.gov.gr/). In addition, he was referred to the Concept Paper of the "Digital Transformation" Programme, which is the initial text of consultation with member states of EU and discussion with the competent services of the European Commission focusing on the main strategic choices and the proposed Architecture of the Programme (Strategy, Priority Axes, Specific Objectives, Categories of Interventions, Indicative Actions).

Next, Mr Meletios answered what is the envisaged end state and what are the main levers that will push towards that direction. According to his answer, "*70% of the cost of the projects will be financed by the Recovery and Resilience Facility (RRF). The remaining 30% will be financed from the national resources of the Public Investment Programme. Funding from PPP & Venture Capitals do not yet apply to the IT & Telecommunications projects of the Ministry of Digital Governance*".

As about the main obstacles & difficulties of digital transformation in the public sector, he paid attention to "*lack of objectives and corresponding evaluation in the public sector, lack of executives in the public sector with the corresponding know-how, bureaucracy, antiquated technical proposals of Greek businesses on how to implement new projects, while he also mentioned the risk for absence of sufficient capacity on the part of the implementation teams (IT & telecommunications companies) to implement the projects that have been announced, in the period 2021-2025*".

Regarding the most important opportunities for digital transformation in the public sector, Mr Meletios was referred to the "*continuous and rolling improvement of state*

operations for citizens, as well as to the profit & experience for firms, by the implementation of the projects to be announced".

With reference to the changes required in the regulatory framework in order for the Public Sectors' digital transformation to become effective, he stated that "*The Ministry of Digital Government in the context of its overall mission for the digital transformation of the country, proceeds to the development of the National Register of Procedures".* He also stated the importance of the ongoing review of the Public Procurement Legislative Framework. The main points are:

"*a. The time for announcing the projects is reduced*

b. From 20,000 to 30,000 direct assignment.

c. The required documents for participation in a competition were reviewed.

d. The "Electronic Directories" were established for the purchase of products that are repeatedly purchased".

Regarding the next plans, for the acceleration of the digital transformation in the public sector in line with international good practices, Mr Meletios supported that "*our main final goal is to make all our transactions with the State through the mobile phone. Our strategy is to monitor the policies of other EU countries based on where they are in each sector in the DESI index, to evaluate them, to customize them according to our own needs and finally to adopt them, making where necessary the corresponding optimizations / changes".*

In the final question, he was referred to the pandemic and digital transformation. He definitely supported that Covid-19 generated a positive force for the beginning of the digital transformation of the public sector: "*The pandemic has drastically helped in the immediate adoption of new working models and in general in the formation of a new digital culture of the citizens, detaching them from the traditional forms of communication & work".*

5.2.3 Interview to Greek Enterprises

Mrs Georgia Botsika, Cluster General Manager Greece & Cyprus of Printec Enterprise, was asked to mention the opportunities of Industry 4.0 and how does the current innovation model of manufacturing in Greece need to change to take these opportunities. According to her answer, "*smart technologies like IoT, mobility, biometrics, and ePayments are changing the way businesses interact with their customers or potential customers... an example is the digital onboarding of a new customer opening a bank account... business-to-business interactions are being affected by technological change. Secure communication supports the digital transformation of the business. An example is the digital invoicing that applies to all industries".*

As about what is the most influential technology for digital transformation in the public sector, she stated that great progress takes place as about using digital channels and mobile channels, but this is limited to those familiar with such technologies. For those who are not as technologically savvy, the public sector is using tools like kiosks, eSignature etc. The participant states that *"the next step is the customer on boarding and service through digital (mobile) or semi digital (Self Service Machines) channels and the "Service by appointment" when it is necessary"*.

Mrs Botsika next answered how can the digital governance project create new opportunities for Greek businesses. With reference to her statement, it is great opportunity *"to create synergies with other industries (such as banks or even retailers etc) to service the public"*. Further, remote service spots equipped by Self Service Machines are also important.

Referring to the changes required in the regulatory framework in order for the Public Sectors' digital transformation to become effective, she supported that *"the existing framework is wide and strict enough for most initiatives takes by the public sector. Still, we need to ensure that all processes – especially those including authentication or monetary transactions - are covered by standards like the ones that cover the financial industry. Existing regulatory frameworks (PSD2, GDPR, etc) covers most of them, but there are cases where they need to become "stricter", e.g., how often you renew your credentials in TaxisNet"*.

Mrs Botsika next stated that *"municipalities are utilizing technologies for themselves, but in a rather isolated and parallel way. What the government could do is utilize technologies such as self-service channels across the country, to have one, unified experience for citizens. Examples are unattended payments for products or services, or info points that work with mobile, or electric chargers for car's charging in public buildings. Electronic ticketing is also a new way of supporting public events"*.

Finally, she was positioned regarding the pandemic and digital governance in Greece. As she stated, the pandemic offered a chance for education in digital channels for both users and employees. Plus, government moved to modernizing processes and businesses set the framework for further growing their technology offerings. Digital transformation of public sector and of individuals / consumers is obvious the trend of the future.

Mr Milonopoulos Nikolaos, Associate Professor of Digital Business at ALBA Graduate Business School, also answered the interview. With reference to the first question, he paid attention to *"the fusion of the physical systems (machines, buildings, warehouses, etc.) with their digital twins (their virtual representations in data, simulations, visualizations etc.)"*. He also focused on taking advantage of the opportunities that come from the investment in individual skills and organizational capabilities (data science, simulation, optimization, software development, wireless networks, cybersecurity, etc), that can strengthen innovations.

Next, he considered that is the most influential technology for digital transformation in the public sector is Open data and APIs, leading to "*innovation, transparency and public accountability, and interoperability within the public sector and between the public and private sectors*".

Mr Milonopoulos supported that digital governance project create new opportunities for Greek businesses. This can happen especially via reducing transaction costs and via strengthening productivity, innovation and investment. Further, as he stated, a fairer and level playing field for all can exist, reducing opportunities for favorable treatment. As he supported, "*the net result of all the above improves what is known as the ease of doing business in the country - a key factor for incentivizing domestic investment and attracting foreign investment*". Of course, he mentioned that this is not sufficient: "*predictability/certainty of the tax burden, distorted tax incentives, reliability and efficiency of the justice system, are of crucial importance. Reform and digitalization in these domains are also urgent and important in education, financial services, public infrastructures, logistics infrastructures and others*".

As about the changes required in the regulatory framework in order for the Public Sectors' digital transformation to become effective, he mentioned that he does not have the expertise to further analyse this theme, but he tried to cover it through the previous question of the interview.

The participant was next positioned about how can local government leverage smart city technologies to stimulate new investments and economic development and what could central government do to assist local efforts. According to his answer, "*cities should invest in their smart infrastructures (with sensors everywhere) and open data, and refrain from investing in services that can be implemented by private initiatives… they should incentivize the private sector to develop services on top of public infrastructures and data…the central government should impose a (digitally enabled) framework of complete public transparency and accountability around city finances and operations, facilitate shared digital services that are common across cities and set standards for data interoperability across cities for non-shared services that are not provided by the central government. The greatest challenge for cities will be their ability to maintain their digital infrastructures over time*".

Finally, he was asked to analyse the case of the pandemic and its relation to digital transformation. Mr Milonopoulos supported that "*pandemic was an opportunity. But that window is closing fast as the economy is already moving out of social distancing restrictions*". However, he focused on the importance of a continuous effort by politicians, the public sector, and citizens to keep and improve digitalized processes. In this effort, infrastructure and skills are fundamental.

Mr Giannis Doxaras, Founder & CEO, Warply also took place in the interview. As about the first question, he stated that opportunities come from optimizing product design/marketing (consumer-facing) functions and optimizing production/distribution.

Higher opportunities reveal on the second pilar due to the fact that "*cost optimization is probably the low hanging fruit of digital transformation in the industry*".

He next answered what is the most influential technology for digital transformation in the public sector. According to him, "*technologies RPA are those that are relating to critical infrastructure long-lasting problems (e.g., digitizing physical documents of EFKA) and marketing automation software to deliver a citizen-first culture to public sector services*".

With reference to the way that the digital governance project creates new opportunities for Greek businesses, he stated that this can be done by two ways: "*cut costs by removing unnecessary bureaucracy and providing data to create new business models (e.g., centralized credit scoring via API for micro-loan disbursements)*".

Mr Doxaras next stated that the main changes required in the regulatory framework in order for the Public Sectors' digital transformation to become effective refer to opening transactional data and services to 3rd parties. He mentioned two examples: "*open a vending API for Greek museums to 3rd party apps (from tour operators, local startups etc.) and open a vending API for on-street parking to be consumed by Hertz or Avis app from tourists renting cars*".

In the next question of the interview, he was asked to state how can local government leverage smart city technologies to stimulate new investments and economic development and what could central government be doing to assist local efforts. According to his answer, the above can me manages through "*opening data and APIs not only informational but transactional as well, consolidating services in unified citizen interfaces and leveraging data to extract and deliver knowledge to citizens*".

In the final question he was positioned about the pandemic and digital governance in Greece. Mr Doxaras supported that "*pandemic is definitely a catalyst for exponential acceleration and adoption. It actually affects the most friction imposing factor of digital adoption, that is culture*".

Mr Charis Apostolopoulos, Chief Transformation Officer PMO Global Alliance, was the next participant of the interview. With reference to the first question, he noticed that "*technologies of digital transformation often include artificial intelligence (AI), machine learning, cloud computing, robotic process automation, data management and analytics solutions, edge computing, block chain and the Internet of Things (IoT). On the horizon three are other emerging technologies like 5G, currently under deployment in many countries. Of course, it is worth mentioning the digital twin technologies that can result to cost-effective decentralised decisions*". As he supported, it is emergent to adopt such innovations in Greece. However, meritocracy and bureaucracy serve as the main obstacles. It is important to find sustainable solutions in the new digital era and make changes to the corporate strategy, culture, technology and organisational processes.

For Mr Apostolopoulos, the most influential technology for digital transformation in the public sector is Artificial Intelligence (AI). As he supported, "*AI will change the workplace and the jobs that humans do… AI could help people with improved health*

care, safer cars and other transport systems, tailored, cheaper and longer-lasting products and services. Overall, AI can enable the development of a new generation of products and services".

With reference to the way that the digital governance project creates new opportunities for Greek businesses, he stated that is important to ensure that digital governance is transparent and the right professionals (top-notch skills and capabilities) are engaged. At a government level, he mentioned that things are far more complex, mentioning that "*if the governance framework is embraced with innovation, then it can create several opportunities for Greek business.*"

He next referred to the changes required in the regulatory framework in order for the Public Sectors' digital transformation to become effective. According to his answer, this theme is rather complex. "*Due to the changing nature of technology the regulatory framework needs to keep changing as well. I guess, a closer cooperation among the government, universities and the industry will be a good start. Next, proper funding will be required. Citizens need to be educated on the benefits of Digital Transformation implementation*".

In the next question, he was asked to answer how can local government leverage smart city technologies to stimulate new investments and economic development and what could central government be doing to assist local efforts. Mr Apostolopoulos stated that smart cities are not a new concept. "*The central government can enforce an investment and regulatory framework and on top of that perhaps with PPP fund the business models. As an example, existing infrastructure for energy, water and transportation systems can be improved*".

In the final question, Mr Apostolopoulos was positioned regarding covid -19. He stated that many reports exist revealing that pandemic has been an opportunity for digital transformations. Among the reports he mentioned are those of UNESCO, KPMG, Deloitte, McKinsey etc. He further supported that digital governance is improved in Greece in the time of Covid-19 crisis and for sure, innovation and improvements are a challenge for the future.

5.2.4 Interview to Greek Public Sector

Mr Ilias Apostolopoulos, Mayor of Papagos Municipality, was the participant in this interview. Regarding the main obstacles & difficulties of digital transformation in the public sector, he stated that "*training of civil servants on new technologies, appropriate institutional infrastructure and updating of the legal framework to support new technologies are some of the "problems" that the State must face in order to proceed with the transformation. The main obstacles on the part of the citizens are the ignorance of the existence of electronic services through which they could be served, the ignorance of the use of electronic services or the lack of familiarity, the insecurity they feel in the digital environment, the lack of the necessary means for their use and of course the habit of the natural process and service in a close manner*".

As about the benefits citizens & businesses will get through the digitalization of the public sector, he mentioned "*the removal of dozens of malfunctions, the improvement of the quality of citizen service, a more complete, faster and quality service to citizens and businesses, reduction of the bureaucracy and of the high administrative burden on the public sector and on citizens or businesses*".

Regarding the next plans for the acceleration of the digital transformation, Mr Apostolopoulos made reference to the concept of "*smart cities for the development of digital applications and the installation of smart equipment in municipalities of the country, to upgrade public life, improve the daily lives of citizens, protect the environment, tackle climate change and reduce energy fingerprint*". He stated as example the "Citify Papagou - Holargos Smart City", which was distinguished at the 4th annual conference for "Smart Cities" and "Digital Citizens - Smart Cities - Digital Excellences 2019". Further, he mentioned the applications "GreenCity" and "e-polis", the consultation platform through the website of the Municipality, the Geospatial Information System (GIS) for the management and distribution of maps via the Internet, the idea recording platform "Post-It", the "Digital Assistant", the smart lighting system and smart parking.

The participant next answered what is the envisaged end state and what are the main levers that will push towards that direction. According to his statement, "*with the necessary toolbox and the necessary directions, the digital transformation plan has been drafted, adapted to the local challenges but at the same time integrated in the basic principles of the new digital strategy. He made reference to "funding from European co-financed programs, national resources or specialized funding frameworks such as e.g., the "Antonis Tritsis" program*".

Finally, he was asked to express his opinion about the pandemic and digital transformation. As he supported, "*the difficulties of the pandemic period accelerated the need for the implementation of digital functions throughout the public sector. The cessation and restrictions of work in some industries, the new rules of health and safety, led to a "sudden" digital transformation, during which specific functions and processes had to be reformed and adapted to a digital environment*". At the end, he mentioned that "*E-learning, teleworking, e-government, e-commerce and e-banking either created from scratch or adapted and further developed to continue with in a way the socio-economic life of the country. Part of the European recovery package is moving in this direction, which, among other things, envisages the complete digital transformation of cities*".

Mr Angelos Amditis, Research Director at ICCS, Chairman of ERTICO-ITS Europe, Deputy Chairman at OASA, Vice President of ITS Hellas, member of the ALICE Executive Group, member of EYDAP S.A. Board of Directors, also answered the interview questions, representing Public Sector. With reference to the first question, he was asked to present the main obstacles & difficulties of digital transformation in the

public sector, where he stated the following: "*bridging research, technology and innovation, creating a framework that promotes the synergies of the public sector with the industry and the services sector, building the technical infrastructure, raising awareness on the benefits of digitalization for the public sector and finally, establishing the procedures that promote and embrace innovation*".

As about the benefits he expects citizens & businesses will get through the digitalization of the public sector, he made reference to the digital strategy of EU where the benefits of the digitalization of the public sector are including more efficiency and savings for governments, businesses and citizens, as well as increasing transparency and openness.

With reference to the next plans, for the acceleration of the digital transformation, he focused on artificial intelligence and virtual reality. As he supported, it is of high importance to ensure interoperability, quality, openness, connectivity while it is also important to develop MaaS services (e.g., new models for services and business).

Regarding what is the envisaged end state and what are the main levers that will push towards that direction, he stated that "*our vision in the mobility sector leads us to the smart cities and smart societies of the future. This can only be realized and implemented through very hard work on the level of international cooperation in Europe, all actors involved in the European ecosystem of mobility: policy, research, industry, academia, business, innovation – oriented institutions, local authorities, governments etc should join their forces placing the citizens and societal needs at the center. EU funding, state funding and venture capitals are all equally important actors in this effort*".

In the last question, he was asked about the and digital transformation in Greece. As he mentioned, "*pandemic seems to have accelerated our way towards digitalization in Greece and although it has posed great challenges to the logistics and transport sector, it has also created opportunities to rethink our mobility needs and turn towards more sustainable and green solutions*".

5.2.5 Case study – ODAP

In this part of the research, two interviews were taken, by Mrs P. Tasiogiannopoulou, Project Manager, ERP Galaxy/ POS Retail and Mr Pantelis Tsironis, Project Manager for e-ticketing systems & access control.

Participants were firstly asked to mention what were the challenges of the project and how did they manage them. Mrs P. Tasiogiannopoulou stated that ERP Galaxy/ POS Retail project is really demanding, where crucial success factor is the sponsor (which is often the management of the institution) who supports every decision whether it lies in organizational changes or process changes. Besides the importance of the role of the Project Manager, human resources are also a catalytic success factor. Further, equipment both in hardware and software, organized databases and of course an adequate backup process are also important. Apart from the challenges faced by internal

factors, major challenges are generated by external factors such as that of the recent pandemic where schedules were delayed.

Mrs Tasiogiannopoulou was next mentioned on the benefits that the organization will enjoy from the implementation of this project. As she stated, POS RETAIL/ GALAXY which was implemented in 8 points of sale (shops of archeological sites and museums) as well as in the model warehouse in Renti, brought a new image to the customer as well as significant improvement in the Backoffice of the organization. BARCODE SCANNERs exist in sales points, while there is also connection to ERP GALAXY of central service, giving the management the opportunity to know om real time the sales from each shop per item code. A main benefit is the full transparency of the entity in sales, stocks, physical inventories that are now recorded in the system by the store managers as well as the management of receipts and the agreement with the banks. Of course, the improvement of the image of the sales offices to the external customer is something that improved the image not only of the Organization for the Management and Development of Cultural Resources (ODAP) but also of the Ministry of Culture. Mrs Tasiogiannopoulou made reference to the E-TICKET system, as well as to the database that was created for all the properties of the Ministry of Culture managed by the Organization for the Management and Development of Cultural Resources. Significant benefits resulted from the implementation of the commercial management of all issues managed by the organization. All documents are issued by ERP while management of the agency's expenses is also more effective due to automation.

In the final question, Mrs Tasiogiannopoulou was asked to express her opinion about the next steps/projects towards the digital transformation of the organization. According to her answer, the completion of the implementation of the remaining subsystems of ERP is crucial, while also important is the implementation of the automatic production process in ERP. Further, she mentioned the implementation of the management of procurement contracts of items, materials and services in the ERP, the extension of the implementation of the retail sales system POS RETAIL GALAXY in the majority of sales, while it would be important to implement an e-shop platform with automatic interconnection to the ERP and the warehouse of items. Finally, she supported that it is equally important the implementation of the electronic e ticket in other archaeological sites that have significant traffic.

As about the answers given by Mr Pantelis Tsironis, he was firstly positioned on the challenges of the project and how did they manage them. He mentioned that the electronic purchase was applied for the first time and it has been necessary to overcome attitudes and a number of, non-essential, bureaucratic issues. These were dealt with Reknit political will and corresponding interventions, as far as possible and with the public interest in mind. People who believed in the upgrading of the Services were found, they were willing to cooperate, even the qualifications to operate the Project. The main issues that arose were internal communication and responsibilities. These issues have never been adequately addressed. The cooperation with the Contractor of

the Project, determined many times the successful communication of an issue and the process of its dissolution.

Mr Tsironis was next mentioned on the benefits that the organization will enjoy from the implementation of this project. As he stated, the first phase of implementation concerns the 11 points, of high archaeological interest and high traffic, including Acropolis, Aristotle High School, Roman Archaeological Site, Archaeological Museum, and Museum of Ancient Messina, which collect 40% of visitors and 55% of revenues. Digitization of the Services enables users (Visitors – Citizens – Employees) to have direct access, reliability and control, on whatever side they are on. The safeguarding of public money through electronic payments and applications has multiple benefits for a Public Organization. Mr Tsironis also made reference to the etickets.tap.gr platform that operates since July 19th, 2018. In the first phase, 3 geographical areas of the country have been included in the electronic ticket: Attiki-Peloponnesus-Crete.

In the final question, he was asked to express his opinion about the next steps/projects towards the digital transformation of the organization. According to his answer, these are: the inclusion of even more important Monuments, Museums and Archival sites in the e-Ticket, the development of the corresponding mobile applications for the issuance of tickets for the archaeological sites, the full implementation of the ERP in all activities of the Agency, the provision of electronic tours through corresponding applications, and finally, the creation of an e-shop for the products of the shops of the archaeological sites.

Chapter 6. Conclusions

The present thesis analysed the concept of digital transformation of the Greek Public Administration, focusing on the evaluation and development strategies that will contribute to moving towards a digital economy. The main axes that were analysed are Public Administration, Digital transformation and Governmental digitalization. Public Administration has as a purpose to promote a superior understanding of government and its relationship with the society it governs, as well as to encourage public policies more responsive to social needs. Digital transformation is the process of using digital technologies to create new — or modify existing — business processes, culture, and customer experiences to meet changing business and market requirements. It includes the networking of actors such as businesses and customers across all value-added chain segments and the application of new technologies, while it also requires skills that involve the extraction and exchange of data as well as the analysis and conversion of that data into actionable information. Digital transformation in the public sector is oriented under the term of "e-government". Governmental digitalization refers to public sector reforms through the adoption of information and communication technology (ICT) solutions in order to optimize operations and provide better services to customers – or citizens. In many cases, researchers relate digital government transformation to the application of technologies in government, such as blockchain, Internet of Things or artificial intelligence.

The concept of digital transformation of the public administration is a process that requires the implementation of a model of administration, covering horizontally all actors in general government and the wider public sector. The existence of trust in digital transformation of the public administration is presented in the literature as an essential element that is necessary for its successful adoption. Other factors that are considered to be essential for the digital transformation of the public administration are leadership, infrastructure, information management, human resources and organizational culture of public sector.

With reference to Greece, the 'Digital Transformation Paper' reflects the new national digital strategy, including many IT projects, some in a short-term and other in a longer-term preparation. The Ministry of Digital Governance is a new element in the Greek government bringing together all the Information Technology and Telecommunications infrastructure, related to the provision of digital services to citizens and businesses in the country. Its strategic target is to provide the necessary framework for citizens and businesses in Greece to truly benefit from an inclusive Digital Single Market in the European Union, having the ability to both design and use effective digital services in a broad range of sectors including public administration, justice, health, energy, and transportation. Greece ranks low in international indicators with reference to its digital maturity across countries around the world. Our country has faced many difficulties in implementing gradual and evolutional digital strategies. Except the concept of time, among the most important difficulties and obstacles of the digital transformation within the public administration of Greece is the absence of digital literacy of citizens

(especially the elderly). What is more, education on ICT in often missing with reference to the public sector employees. Lack of internal capacities, infrastructure and personnel are factors that are considered to be obstacles for the development of digital technologies in the public sector. The rapid speed of technological change, combined with the low digital maturity of Greece, creates the urgent need for the country to act immediately for strengthening Digital Governance.

The present research was based on a mixed method, via a combination of quantitative and qualitative research, using as research tools the questionnaire and the interview respectively. Further, a case study was analysed, by studying the digital transformation of the Hellenic Organization of Cultural Resources Development, under the auspices of the Ministry of Culture & Sport. The sample of the quantitative research consisted of 150 employees in the public sector of Greece, men (58%) and women (42%) over 22 years old. The simple random sampling method was used in the present research. Most of the employees had Postgraduate studies and more than 10 years of working experience in the Greek Public sector. With reference to the qualitative research, semi-structured interview was used as a research tool in the present study. All questions are open-ended. In this research, "elite" interviews were applied, into four different sections: interview to the EU, interview to the Greek Government, interview to Greek Enterprises and interview to Greek Public Sector. Finally, a case study was referred to Organization of Management and Development of Cultural Resources (ODAP). Interviews were completed via email. The data selection was conducted by the method of deliberate sampling. The respondents in this research were ten in number. One participant answered the interview representing the EU. One participant answered the interview representing the Greek Government. Two interviews referred to ODAP case study and the rest interviews were coming from Greek Enterprises (four interviews) and Greek Public Sector (two interviews).

Regarding the questionnaire analysis and the part II, most of the participants supported that they do not know what the terminology of digital transformation is and they do not believe that the digital transformation of the Greek public sector has been achieved to a significant extent.

Participants supported that the single Digital Portal / Digital services to citizens, the Identification Centre / Secure Communication for users and Registers and Basic Registers, the Open Data on all services, Common Data Area (Data Repository) are required in the digital transformation of the Greek Public sector. On the opposite, they stated that they do not know if the existence of Interoperability Centre (Functional Interface Technical Centre), Open Science, Single Digital Portal / Digital Services, Identification Centre / Secure Communication for users are required in the digital transformation of the Greek Public sector.

Most of the participants stated that Registers and Basic Registers are not implemented in the digital transformation of the Greek Public sector. Further, they do not know whether the existence of Interoperability Centre (Functional Interface Technical Centre) is implemented in the digital transformation of the Greek Public sector, as well

as tool of Open Data on all services and Open Science. On the opposite, they stated that Common Data Area (Data Repository) are implemented in the digital transformation of the Greek Public sector. Most of participants supported that the digital maturity of the Greece's public administration and digital maturity of the citizens in Greece are from low to very low.

Passing to the part III, most supported that lack of High Technology, lack of connectivity, digital Skills of Employees in Public Administration, regulatory framework of the employees in Greek Public Administration, Policies, infrastructures, digital skills of the population and lack of financial resources are very important difficulties or obstacles in the digital transformation of the Greek Public administration. However, they supported that the ageing Population of the country is from a somewhat to a very unimportant difficulty or obstacle in the digital transformation of the Greek Public administration. Participants were neutral about whether the lack of accessibility to new technologies of the population (high costs, remote areas, etc.) is an important difficulty or obstacle in the digital transformation of the Greek Public administration.

With reference to part IV, most stated that knowledge and implementation of High Technology, digital skills of Employees in Public Administration, regulatory framework and financial resources are essential for the digital transformation of the Public Administration in Greece. Participants were neutral about whether advanced digital skills of the Population, effective policies and equal population accessibility to new technologies are necessary for the digital transformation of the Public Administration in Greece.

Last, in part V, it was found that most of the participants supported that they had not been working remotely at all through laptop or other digital device (for instance work from home) before lockdown, they have few replaced physical documents with digital files at their work, while they believe that many kinds of digital technologies should be implemented in the public sector, like the Website, the Enterprise Resource Planning (ERP) system, the E-learning platform, Cybersecurity, Ticketing system, Social media platforms and Customer Relationship Management (CRM) system. Finally, employees of the Greek public sector supported that they use Customer service through email and Website most.

As about the interview analysis, it was obvious that the EU Digital Strategy is really important for the digitalization of the public services, highlighting the importance of Commission's vision on digital transformation by 2030. Progress of the EU member states via indexes, applied projects related to the digitalization of the public services and their fund, benefits to EU citizens and opportunities that pandemic created for digital transformation of the public sector are all matters of great importance. For Greek Government, "Digital Transformation Paper 2020-2025" represents the main effort towards that direction. Obstacles and difficulties remain, but important opportunities come up for digital transformation in the public sector and many international good practices can contribute to this. Definitely, Covid-19 generated a positive force for the beginning of the digital transformation of the public sector.

Representers of Greek Enterprises also mentioned the opportunities of Industry 4.0 and how does the current innovation model of manufacturing in Greece need to change to take these opportunities. As it was revealed, the most influential technology for digital transformation in the public sector has to do with digital channels and mobile channels. Self Service Machines, Open data and APIs, RPA, Artificial Intelligence are also very important. Changes are required in the regulatory framework in order for the Public Sectors' digital transformation to become effective. Finally, the pandemic seems to offer a chance for education in digital channels for both users and employees, while helped government to move to modernizing processes and businesses set the framework for further growing their technology offerings. Investment in individual skills and organizational capabilities can strengthen digital innovations towards this direction. In general, digital governance project create new opportunities for Greek businesses.

As about Greek Public Sector, obstacles and difficulties of digital transformation also exist, mainly the ignorance of the existence and use of such tools and the lack of the necessary means for their use. Due to the various benefits for citizens and businesses, it is important to set directly the next plans for the acceleration of the digital transformation. Smart City concept is a fundamental element in this area. Funding from European co-financed programs, national resources or specialized funding frameworks are also important. Finally, with reference to the pandemic, difficulties of that period accelerated the need for the implementation of digital functions throughout the public sector. The country must take advantage of the opportunities and turn towards more sustainable and green solutions.

Finally, the analysis of the case study "ODAP" showed that the running projects are characterized by various challenges generated by both internal and external factors such as that of the recent pandemic. Definitely, important benefits come from the implementation of these projects. Next steps towards the digital transformation of the organizations include the implementation of ERP, the e-shop platform, as well as the e-ticket.

Concluding, all the above highlight the importance of digital transformation of the Greek Public Sector, via effective evaluation and development of strategies that will generate the conditions for adopting the great benefits which come from the implementation of such projects and tools. Next steps towards the digital transformation are arising and Greece must capture the chance to overcome difficulties and obstacles in order to reach to a more efficient level of governmental digitalization.

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Appendix A (Questionnaire)

TECHNICAL UNIVERSITY OF CRETE

SCHOOL OF PRODUCTION ENGINEERING & MANAGEMENT

MASTER IN TECHNOLOGY & INNOVATION MANAGEMENT

"Digital Transformation of the Greek Public Sector: Evaluation and Development Strategies"

Part I: Demographics

1. Gender: M ☐

           F ☐

2. Age:

22 – 29	
30 – 39	
40 – 49	
50 – 59	
60 +	

3. Level of Studies:

Graduate Studies	
Postgraduate Studies	
Doctoral Studies	
Other	

4. How many years have you been working in the Greek Public sector?

Less than 1 year	
1-5	
6-10	
10+	

5. Residential Area

City	
Island	
Village	

Part II: Current national digital strategy for the digital transformation of the public administration

1. Do you know what the terminology of digital transformation is?

Yes	
No	

2. Do you believe that the digital transformation of the Greek public sector has been achieved to a significant extent?

Yes	
No	

3. Which of the following do you believe is required in the digital transformation of the Greek Public sector?

	Yes	No	I do not know
1. Single Digital Portal / Digital Services to Citizens			
2. Identification Center / Secure Communication for Users			
3. Registers and Basic Registers			
4. Interoperability Centre (Functional Interface Technical Centre)			
5. Open Data on all services			
6. Common Data Area (Data Repository)			
7. Open Science			

4. Which of the following do you believe that is implemented in the Greek Public Sector?

	Yes	No	I do not know
1. Single Digital Portal / Digital Services to Citizens			
2. Identification Center / Secure Communication for Users			

3. Registers and Basic Registers			
4. Interoperability Centre (Functional Interface Technical Centre)			
5. Open Data on all services			
6. Common Data Area (Data Repository)			
7. Open Science			

5.On a scale of 1 to 10, where 1 corresponds to 10% and 10 to 100%, to what extent do you believe that the digital maturity of the Greece's public administration is?

1	2	3	4	5	6	7	8	9	10

6. On a scale of 1 to 10, where 1 corresponds to 10% and 10 to 100%, to what extent would you assess the digital maturity of the citizens in Greece?

1	2	3	4	5	6	7	8	9	10

Part III: Difficulties and obstacles for Digital Transformation within the public administration of Greece

1. How important do you think are the following difficulties or obstacles in the digital transformation of the Greek Public administration.

Answer by giving a score from 1 to 5, where

1 = Very unimportant

2 = Somewhat unimportant

3 = Neutral

4 = Somewhat Important

5 = Very Important

1. Lack of High Technology	
2. Connectivity Infrastructure	
3. Digital Skills of Employees in Public Administration	
4. Regulatory Framework	
5. Policies	

6. Infrastructures	
7. Digital Skills of the Population	
8. Lack of financial resources	
9. Ageing Population of the country	
10. Lack of accessibility to new technologies of the population (high costs, remote areas, etc.)	

Part IV: Essential elements for the digital transformation of the public administration

1. To what extent do you think each element of the following is necessary for the digital transformation of the Public Administration in Greece?

Answer by giving a score from 1 to 5, where

  1 = Not at all
  2 = not very
  3 = Neutral
  4 = somewhat
  5= Very much

1. Knowledge and implementation of High Technology	
2. Advanced digital Skills of the Population	
3. Advanced digital Skills of Employees in Public Administration	
4. Regulatory Framework	
5. Effective policies	
6. Financial Resources	
7. Equal population accessibility to new technologies	

Part V: Digital technologies used in the public administration

1. At which level have you been working remotely through laptop or other digital device (for instance work from home)?

2. Not at all	
3. Not very	
4. Neutral	

5. Somewhat	
6. Very much	

2. At which level have you replaced physical documents with digital files at your work?

1. Not at all	
2. Not very	
3. Neutral	
4. Somewhat	
5. Very much	

3. Which kind of digital technologies do you believe that should be implemented in the public sector?

1. Customer Relationship Management (CRM) system	
2. Enterprise Resource Planning (ERP) system	
3. Human Resources Management and Information system (HRMS)	
4. Ticketing system	
5. Evaluation system	
6. Big Data Analytics	
7. E-learning platform	
8. Internal Chat	
9. Website	
10. Social media platforms	
11. E-shop	
12. Cloud Computing & services	
13. Cybersecurity	
14. Other	

4. Please determine the digital channels/contact points you use most to interact with your customers.

1.	Website	
2.	Customer service through email	
3.	Social media platform	
4.	Video calls	
5.	Chat	
6.	Mobile applications	

Appendix B (Answers of the interviews)

> ➤ **Mr. Norbert Sagstetter, Head of Directorate-General for Communications Networks, Content and Technology, European Commission.**

1. What is the EU digital strategy for the digitalization of the public services?

The Covid-19 pandemic has radically changed the role and perception of digitalization in our societies and economies, and accelerated its pace. Digital technologies are now imperative for working, learning, entertaining, socialising, shopping, interacting with governments and accessing everything from health services to culture. In light of these changes, the ambition of the European Commission is more relevant than ever: to pursue digital policies that empower people and businesses to seize a human centred, sustainable and more prosperous digital future.

On 9 March 2021, the Commission presented a vision and avenues for Europe's digital transformation by 20302. This vision for the EU's digital decade evolves around four cardinal points, one of which is the digitalisation of public services.

By 2030, the EU's objective is to ensure that democratic life and public services online will be fully accessible for everyone, including persons with disabilities, and benefit from a best in-class digital environment providing easy-to-use, efficient and personalized services and tools with high-security and privacy standards. Secured e-voting would encourage greater public participation on democratic life. User-friendly services will allow citizens of all ages and businesses of all sizes to influence the direction and outcomes of government activities more efficiently and improve public services. Government as a Platform, as a new way of building digital public services, will provide a holistic and easy access to public services with a seamless interplay of advanced capabilities, such as data processing, AI and virtual reality. It will also contribute to stimulating productivity gains by European business, thanks to more efficient services that are digital by default as well as a role model incentivising businesses, in particular SMEs, towards greater digitalisation.

By 2030, the objective of the new Communication is to have:

- 100% online provision of key public services available for European citizens and businesses

- 100% of European citizens have access to medical records (e-records)

- 80% of citizens will use a digital ID solution.

The EU's digital ambitions for 2030 will be translated in concrete terms via:

- Targets and key milestones

- Digital principles to inform users, and guide policy makers and digital operators

A robust joint governance structure including a traffic light monitoring system to identify successes and gaps

- Multi-country projects combining investments from the EU, Member States and the private sector.

As a follow-up to its Digital Decade3 Communication of 9 March, the Commission has launched a public consultation4 on the formulation of a set of principles to promote and uphold EU values in the digital space. Margrethe Vestager, Executive Vice-President for a Europe fit for the Digital Age, said: "A fair and secure digital environment that offers opportunities for all. That is our commitment. The digital principles will guide this European human-centred approach to digital and should be the reference for future action in all areas. That's why we want to hear from EU citizens." Commissioner for Internal Market, Thierry Breton, said: "This is Europe's Digital Decade and everyone should be empowered to benefit of digital solutions to connect, explore, work and fulfil one's ambitions, online as offline. We want to set together the digital principles on which a resilient digital economy and society will be built." The consultation, open until 2 September, seeks to open a wide societal debate and gather views from citizens, non-governmental and civil society organisations, businesses, administrations and all interested parties. These principles will guide the EU and Member States in designing digital rules and regulations that deliver the benefits of digitalisation for all citizens. The contributions to the public consultation will feed into a proposal from the Commission for a joint inter-institutional declaration on Digital Principles of the European Parliament, the Council, and the Commission. The proposal is expected by the end of 2021.

2. How will progress of the EU member states be assessed and reviewed?

The European Commission monitors the progress of EU Member States through two main indexes:

1) The Digital Economy and Society Index (DESI)5: is a composite index that summarises relevant indicators on Europe's digital performance and tracks the evolution of EU Member States in digital competitiveness. By providing data on the state of digitisation of each Member State, it helps them identify areas requiring priority investment and action. Since 2014, the Commission has been tracking the penetration of digital technologies in society and the economy via DESI. The latter is made up of 5 dimensions:

a. Connectivity: Fixed broadband take-up, fixed broadband coverage, mobile broadband and broadband prices

b. Human Capital: Internet user skills and advanced skills

c. Use of Internet: Citizens' use of internet services and online transactions

d. Integration of digital technology: Business digitisation and e-commerce

e. Digital public services: e-Government.

The Commission is in the process of reviewing DESI to align it with the needs of monitoring implementation of the Digital Decade targets and the Digital Compass.

2) E-Government Benchmark6: is the second index and it evaluates progress on key components of the eGovernment Action Plan 2016-2020, the Tallinn Declaration on eGovernment7 and the accomplishment of a European Digital Single Market. The average score of the four top-level benchmarks represents the overall eGovernment performance of a country, from 0% to 100%. In order to give a consistent and repeatable means of making valid comparisons, performance of online public services is evaluated against four "top-level" benchmarks:

a. User Centricity – To what extent are services provided online? How mobile friendly are they? And what online support and feedback mechanisms are in place?

b. Transparency – Are public administrations providing clear, openly communicated information about how their services are delivered? Are they transparent about the responsibilities and performance of their public organisations, and the way people's personal data is being processed?

c. Key Enablers – What technological enablers are in place for the delivery of eGovernment services?

d. Cross-Border Mobility – How easily are citizens from abroad able to access and use the online services?

3. **What projects related to the digitalization of the public services will the EU fund and in which manner? (subsidies? bond covered lending? other type of lending?)**

- The Recovery and Resilience Facility (RRF)8: will make €672.5 billion in loans and grants available to support reforms and investments undertaken by Member States. Each recovery and resilience plan will have to include a minimum of 20% of expenditures to foster digital transition. The Facility is the centrepiece of NextGenerationEU9, a temporary recovery instrument that allows the Commission to raise funds to help repair the immediate economic and social damage brought about by the coronavirus pandemic. The Facility is also closely aligned with the Commission's priorities10 ensuring in the long-term a sustainable and inclusive recovery that promotes the green and digital transitions. The Facility is an opportunity to create European flagship areas for investments and reforms with tangible benefits for the economy and citizens across the EU. These should address issues that need significant investment to create jobs and growth, and which are needed for the green and digital transitions. The flagship ´Modernise´ addresses the digitalisation of public administrations. The Commission has published a draft component on digitalisation of

public services.11 Investments and reforms under the RRF need to be implemented by 2026.

- The Technical Support Instrument (TSI)12 is the EU programme that provides tailor-made technical expertise to EU Member States to design and implement reforms. The support is demand driven and does not require co-financing from Member States. It is an important pillar of the EU's initiative to help Member States mitigate the economic and social consequences of the outbreak of the COVID-19 crisis. Smart, sustainable and socially responsible reforms help to strengthen the resilience of our economies and societies. The TSI offers Member States a unique service to help them tackle reform challenges. The support can take the form of, for example, strategic and legal advice, studies, training and expert visits on the ground. It can cover any phase in the reform process.

- Horizon 202013 is the financial instrument implementing the Innovation Union14, a Europe 202015 flagship initiative aimed at securing Europe's global competitiveness. By coupling research and innovation, Horizon 2020 is helping to achieve this with its emphasis on excellent science, industrial leadership and tackling societal challenges. The goal is to ensure Europe produces world-class science, removes barriers to innovation and makes it easier for the public and private sectors to work together in delivering innovation. Research and innovation related to digital government are funded under Societal Challenge 6. Information about egovernment projects is available on Cordis16, including a Cordis results pack17 on digital government.

- Areas of innovative digital government covered by H2020 projects:

o Data interpretation (transparency)

o Citizen engagement (participation)

o Burden reduction through once only (anticipation)

o Personalised, location-based services (context-aware)

o Co-creation methodology

o Service co-creation (human/urban services)

o Data analytics for decision-making (context-smart)

o Disruptive tech in public administrations (blockchain, AI, …)

o Innovating delivery (new forms of eGovernance)

- The Digital Europe Programme (DIGITAL)18 is a new EU funding programme focused on bringing digital technology to businesses, citizens and public administrations. Digital technology and infrastructure have a critical role in our private lives and business environments. We rely on them to communicate, work, advance science and answer current environmental problems. At the same time, the COVID-19 pandemic highlighted not only how much we rely on our technology to be available to

us, but also how important it is for Europe not to be dependent on systems and solutions coming from other regions of the world. Paving the way for achieving this goal is DIGITAL programme.

- The main aim of the Digital Europe Programme is to build essential capacities and foster strategic autonomy and take-up through high-impact deployments in the fields of Artificial Intelligence, High-Performance Computing, Cybersecurity, Advanced Digital Skills, also in areas of public interest and by public administrations.

- Horizon Europe19: is the EU's key funding programme for research and innovation with a budget of €95.5 billion. It tackles climate change, helps to achieve the UN's Sustainable Development Goals and boosts the EU's competitiveness and growth. The programme facilitates collaboration and strengthens the impact of research and innovation in developing, supporting and implementing EU policies while tackling global challenges. It supports creating and better dispersing excellent knowledge and technologies.

- Support for digital government is envisaged under Pillar 2 Global Challenges and European Industrial Competitiveness Cluster 2 Culture, Creativity and Inclusive Society.

- Connecting Europe Facility (CEF)20. €1.04 billion is made available for the telecommunications sector under the CEF programme for 2014-2020. Additionally, CEF provides, for reuse and free of charge, several Building Blocks that are very relevant for digital government, such as eID and eDelivery.

- European Regional Development Fund.21 The ERDF aims to strengthen economic and social cohesion in the European Union by correcting imbalances between its regions. Certain projects related to digital government could be eligible for funding provided under the ERDF.

4. **What are the benefits you expect EU citizens will get through the digitalization of the public sector?**

There is a long list of expected benefits that are associated with the digitalization of public sector and public services:

1) Improved administrative efficiency, reduction of administrative burden and better coordinated programs/services

2) Improved administrative processes, government capabilities, and professionalism

3) Improved decision making and data quality in the public sector

4) Improved user experience, trust and confidence in government

5) Improved inclusiveness of public services

6) Human-centric, inclusive, personalized, easy-to-use, interoperable, responsive, secure, cross-border, reliable and pro-active digital public services

5. **How do you address the different states of maturity with regards digitalization of the various member states?**

The Commission brings Member States together to share experiences and best practices. Member States and EFTA countries share knowledge and best practices on digital government in the eGovernment Action Plan Steering Board22. In addition to their role in overseeing the eGovernment Action Plan 2016-2020, the Steering Board members cooperate on a number of topics that are of particular interest to them, such as artificial intelligence, data analytics and personal data management. The duration of the eGovernment Action Plan Steering Board has been extended until the end of 2021.

Inequalities in maturity with regards to digitalization could be addressed in EU programmes, such as the ERDF23 and TSI24.

The yearly eGovernment Benchmark and DESI indicatorsallow Member States to be informed about their progress and performance in relation to other Member States and the EU average.

In addition, the four cardinal points of the Digital Compass which will translate the EU's digital ambitions for 2030 in concrete terms via targets and key milestones as well as a robust joint governance structure including a traffic light monitoring system to identify successes and gaps to be set out in a Digital Policy programme operationalising the Digital Compass by the end of this summer.

6. **Is the pandemic a threat or rather an opportunity for digital transformation? can improved digital governance in Greece be seen as one of the principal lasting consequences of the covid-19 crisis? how can the next generation EU recovery package contribute to this strategic objective?**

The Covid-19 pandemic has triggered a large set of changes across all government domains. In a very short period, public administrations across all Member States had to increase the number of digital services available for citizens and developments. These developments can be seen in the light of benefits, but also the threats/vulnerabilities they pose for public administrations.

Among positive implications of Covid-19 pandemic for digital government, we highlight:

1) Social and economic activities became more digital, citizens and businesses started relying more on internet and connectivity

2) The availability and uptake of digital public services increased across EU Member States

3) The pandemic has demonstrated that continuity of public services can be ensured with the help of trust services (e.g. eID), allowing for access and delivery of public

services, even when citizens were unable to leave their houses because of lockdowns. Instead, businesses, citizens and public administrations relied on trust services, such as eID.

4) New digital innovations came to the spotlight: e.g. national contact tracing and warning apps, online platforms fighting disinformation, the Digital Green Certificate, …

5) Digitalization of public administrations and public services accelerated and became a top priority across EU Member States

Among negative implications of Covid-19 pandemic for digital government, we highlight:

1) Exposed vulnerabilities of our digital space

2) Increased need for digital sovereignty

3) Influx of counterfeit products and cyber theft

4) The impact of disinformation on our democratic societies

5) Increased digital divide not only between well-connected urban areas and rural and remote territories, but also between those who can fully benefit from an enriched, accessible and secure digital space with a full range of services, and those who cannot.

6) Digital divide has emerged also between businesses already able to leverage the full potential of digital government and those not yet fully digitalized.

7) Exposed the need for Europe to harness digitalization to drive a paradigm change in how citizens, public administrations and democratic institutions interact, ensuring interoperability across all levels of government and across public services.

During the Covid-19 pandemic, Greece was among the countries that progressed significantly in advancing their digital agenda and making online public services available for citizens and businesses. As soon as borders closed and restriction measures were put in practice, the government acted swiftly and decisively in providing public services online, so that citizens and businesses could continue benefiting from public services, receive allowances and claim rights in a situation where physical contact was not always possible or advisable. With innovations in mind, Greece has proved commitment and embraced innovative solutions based on cloud and mobile apps to digitalize public services.

Greece is also showing keen interest to grasp the opportunities offered by the Recovery and Resilience Facility (RRF) and invest further in the digitalization of public administration. In order to benefit from the RRF, Member States should submit their draft recovery and resilience plans outlining national investment and reform agendas in line with the EU policy criteria. Accordingly, the Greek plan is showing a clear vision for a digitally advanced and innovative future by leveraging on successful developments, such as interoperability, use of novel technologies (cloud, AI, data), digital skills of public servants and the digitalisation of local administrations.

➤ **Mr Aris Meletios, Head of the General Directorate of Informatics and Communications of Public Administration of the General Secretariat of Information Systems of the Ministry of Digital Government.**

1. **What is the current national digital strategy for the digital transformation of the public administration?**

Η στρατηγική της Ελλάδας για το ψηφιακό μετασχηματισμό του δημοσίου έχει καθοριστεί, εγκριθεί και αποτυπώνεται στην επικαιροποιημένη «Ψηφιακή Βίβλο 2020-2025»(η οποία και επισυνάπτεται). Λαμβάνοντας υπόψη το όραμα και τους στόχους σχετικά με το ψηφιακό μετασχηματισμό του δημοσίου, έχουν καθοριστεί και τα έργα τα οποία θα πρέπει να υλοποιηθούν για κάθε τομέα του δημοσίου στο εν λόγω χρονικό διάστημα, τα οποία αναλύονται στη Βίβλο αντίστοιχα. Επιπρόσθετα, επισυνάπτεται, το Concept Paper του Προγράμματος «Ψηφιακός Μετασχηματισμός», το οποίο είναι το αρχικό κείμενο διαβούλευσης με «τους εταίρους» και συζήτησης με τις αρμόδιες υπηρεσίες της Ευρωπαϊκής Επιτροπής εστιάζοντας στις βασικές επιλογές στρατηγικής και στην προτεινόμενη Αρχιτεκτονική του Προγράμματος (Στρατηγική, Άξονες Προτεραιότητας, Ειδικοί Στόχοι, Κατηγορίες Παρεμβάσεων, Ενδεικτικές Δράσεις).

2. **What is the envisaged end state and what are the main levers that will push towards that direction (EU funding? ΣΔΙΤ ? State Funding? Venture Capitals?)**

Το 70% του κόστους των έργων θα χρηματοδοτηθεί από το Μηχανισμό Ανάκαμψης και Ανθεκτικότητας (Recovery and Resilience Facility -RRF). Το υπόλοιπο 30% θα χρηματοδοτηθεί από τους εθνικούς πόρους του Προγράμματος Δημοσίων Επενδύσεων. Χρηματοδότηση από ΣΔΙΤ & Venture Capitals, δεν έχουν ακόμη εφαρμογή στα έργα Πληροφορικής & Τηλεπικοινωνιών του Υπουργείου Ψηφιακής Διακυβέρνησης.

3. **What are the main obstacles & difficulties of digital transformation in the public sector, in your opinion?**

a. Έλλειψη στοχοθεσίας και αντίστοιχα αξιολόγησης στο δημόσιο τομέα, λειτουργούν αποτρεπτικά στην υιοθέτηση νέων διαδικασιών και τεχνολογιών.
b. Η έλλειψη στελεχών στο δημόσιο τομέα με την αντίστοιχη τεχνογνωσία. Δε γίνονται νέες προσλήψεις, μόνο μετακινήσεις.
c. Η ελληνική γραφειοκρατία. Δαιδαλώδεις και χρονοβόρες διαδικασίες.

d. Απαρχαιωμένες τεχνικές προτάσεις των ελληνικών επιχειρήσεων σχετικά με τον τρόπο υλοποίησης των νέων έργων.

e. Υπάρχει ο κίνδυνος στο χρονικό διάστημα 2021-2025, να μην υπάρχει το επαρκές δυναμικό από την πλευρά των ομάδων υλοποίησης (εταιρείες πληροφορικής & τηλεπικοινωνιών) να υλοποιήσουν τα έργα τα οποία έχουν προκηρυχθεί.

4. What are the most important opportunities for digital transformation in the public sector?

ΠΟΛΙΤΗΣ:

➢ Συνεχής και κυλιόμενη βελτίωση των κρατικών λειτουργιών: Όλοι οι πολίτες και οι εργαζόμενοι στο δημόσιο, πρέπει να απολαμβάνουν υπηρεσίες από το κράτος, οι οποίες συνεχώς βελτιώνονται και προσαρμόζονται στις εξελίξεις, χωρίς περιττή γραφειοκρατία και ταλαιπωρία και προσαρμοσμένες στις ανάγκες του.

ΕΠΙΧΕΙΡΗΣΕΙΣ:

➢ Κέρδος & εμπειρία από την υλοποίηση των έργων που θα προκηρυχθούν.

5. What are the changes required in the regulatory framework in order for the Public Sectors' digital transformation to become effective?

Το Υπουργείο Ψηφιακής Διακυβέρνησης στο πλαίσιο της γενικότερης αποστολής του για τον ψηφιακό μετασχηματισμό της χώρας, μέσα από τη συνεχή βελτίωση των διοικητικών διαδικασιών, την προσαρμογή και αναβάθμιση των παρεχόμενων υπηρεσιών του Δημοσίου στις εξελισσόμενες απαιτήσεις των πολιτών, της κοινωνίας και της οικονομίας, αλλά και των ενδοδιοικητικών διαδικασιών που αφορούν στην εσωτερική οργάνωση και λειτουργία του δημοσίου τομέα, προχωρά στην ανάπτυξη του Εθνικού Μητρώου Διαδικασιών. Η τήρηση του Εθνικού Μητρώου Διαδικασιών αποσκοπεί στην καταγραφή, αποτύπωση και μοντελοποίηση των διοικητικών διαδικασιών του δημοσίου και κρίνεται αναγκαία για πολίτες, επιχειρήσεις και δημόσιους υπαλλήλους, οι οποίοι μέσω της χρήσης του αναμένεται να αποκομίσουν πολλαπλά οφέλη όπως είναι η άντληση, από ένα μοναδικό σημείο αναφοράς, αξιόπιστης και επικαιροποιημένης πληροφορίας σχετικά με τις υποχρεώσεις και τις οφειλόμενες ενέργειες, τη σχετική νομοθεσία, τα έντυπα αιτήσεων, τα δικαιολογητικά και τα βήματα εκτέλεσης κάθε διοικητικής διαδικασίας του δημοσίου. Το Εθνικό Μητρώο Διαδικασιών, κατ᾽ εφαρμογή των διατάξεων του άρθρου 90 του ν. 4727/2020 και της σχετικής υπουργικής απόφασης, τηρείται στη Γενική Γραμματεία Ψηφιακής Διακυβέρνησης και Απλούστευσης Διαδικασιών και λειτουργικά συνιστά μέρος της Ενιαίας Ψηφιακής Πύλης Δημόσιας Διοίκησης (gov.gr), με την οποία διαλειτουργεί ως

προς τις διαδικασίες που διεκπεραιώνονται μέσω αυτής. Με την αποστολή της 1ης εγκυκλίου (και των σχετικών παραρτημάτων) από τη Γενική Γραμματεία Ψηφιακής Διακυβέρνησης και Απλούστευσης Διαδικασιών σε όλα τα Υπουργεία εκκινούν οι εργασίες για την υλοποίηση του Εθνικού Μητρώου Διαδικασιών με τη συνεργασία όλων των φορέων του δημοσίου. Στην εγκύκλιο παρέχονται οι αναγκαίες κατευθύνσεις και οδηγίες για τις άμεσες ενέργειες των εν λόγω φορέων – κατά την παρούσα προπαρασκευαστική φάση – και πριν την καταχώριση των διοικητικών διαδικασιών αρμοδιότητάς τους στο Εθνικό Μητρώο Διαδικασιών. Η απλούστευση των διαδικασιών της δημόσιας διοίκησης, μέσω της συστηματικής αναθεώρησης των νομοθετικών ρυθμίσεων και των διοικητικών πρακτικών , συντελεί καθοριστικά στη μείωση των εσωτερικών διαδικασιών της δημόσιας διοίκησης και συνακόλουθα στην αποτελεσματικότερη λειτουργία των δημόσιων υπηρεσιών. Πρωταρχικός σκοπός είναι, πριν από την μετατροπή οποιασδήποτε διοικητικής διαδικασίας σε ψηφιακή, αυτή να απλοποιείται προκειμένου να αποφεύγεται η ψηφιοποίηση της γραφειοκρατίας.

Συνεχή αναθεώρηση του Νομοθετικού Πλαισίου Δημόσιων Προμηθειών: Επισυνάπτεται η τελευταία αναθεώρηση. Βασικά σημεία:

Μειώνεται ο χρόνος προκήρυξης των έργων

Από 20.000 σε 30.000 η απευθείας ανάθεση.

Αναθεωρήθηκαν τα απαιτούμενα δικαιολογητικά για τη συμμετοχή σε ένα διαγωνισμό.

Καθιερώθηκαν οι «Ηλεκτρονικοί Κατάλογοι» για την αγορά προϊόντων που αγοράζονται επανειλημμένα.

6. **What are the next plans, for the acceleration of the digital transformation in the public sector in line with international good practices?**

Βασικός τελικός μας στόχος είναι «Να κάνουμε όλες τις συναλλαγές μας με το Δημόσιο μέσα από το κινητό». Η στρατηγική που εφαρμόζουμε είναι να παρακολουθούμε τις πολιτικές των άλλων χωρών της ΕΕ με βάση το που βρίσκονται στον κάθε τομέα στο δείκτη DESI, να τις αξιολογούμε, να τις παραμετροποιούμε σύμφωνα με τις δικές μας ανάγκες και τέλος να τις υιοθετούμε, κάνοντας όπου χρειάζεται τις αντίστοιχες βελτιστοποιήσεις/αλλαγές. Όλο αυτό αποτελεί μια αέναη διαδικασία καθώς οι ανάγκες και οι συνθήκες του περιβάλλοντος συνεχώς μεταβάλλονται.

7. **Is the pandemic a threat or rather an opportunity for digital transf ormation? Can improved digital governance in Greece be seen as one of the principal lasting consequences of the Covid-19 crisis? How can the Next Generation EU recovery package contribute to this strategic objective?**

Ασφαλώς ναι! Η πανδημία ήταν η αφορμή για την έναρξη του ψηφιακού μετασχηματισμού του δημοσίου. Βοήθησε δραστικά στην άμεση υιοθέτηση νέων μοντέλων εργασίας και γενικότερα στη διαμόρφωση μιας νέας ψηφιακής κουλτούρας των πολιτών, απαγκιστρώνοντάς τους από τις παραδοσιακές μορφές επικοινωνίας & εργασίας.

➤ Mr Ilias Apostolopoulos, Mayor of Papagos Municipality

1. What are the main obstacles & difficulties of digital transformation in the public sector, in your opinion?

Η εκπαίδευση δημόσιων υπαλλήλων προκειμένου να αποκτήσουν με τις απαιτούμενες δεξιότητες στη χρήση νέων τεχνολογιών, η κατάλληλη θεσμική υποδομή που θα προωθεί την ανταλλαγή και τη συνεργασία μεταξύ των υπηρεσιών του Δημοσίου, αλλά και η επικαιροποίηση του νομικού πλαισίου για υποστήριξη νέων τεχνολογιών είναι κάποια από τα «προβλήματα» που πρέπει να αντιμετωπίσει το κράτος για να προχωρήσει ο μετασχηματισμός.

Βασικά εμπόδια από την πλευρά των πολιτών αποτελούν η άγνοια ύπαρξης ηλεκτρονικών υπηρεσιών μέσω των οποίων θα μπορούσαν να εξυπηρετηθούν, η άγνοια χρήσης των ηλεκτρονικών υπηρεσιών ή η έλλειψη εξοικείωσης, η ανασφάλεια που αισθάνονται στο ψηφιακό περιβάλλον, η έλλειψη των απαιτούμενων μέσων για τη χρήση τους και φυσικά η συνήθεια τη φυσικής διαδικασίας και εξυπηρέτησης εκ του σύνεγγυς.

2. What are the benefits you expect citizens & businesses will get through the digitalization of the public sector?

Ο ψηφιακός μετασχηματισμός της δημόσιας διοίκησης αποτελεί βασικό στοιχείο για την άρση δεκάδων δυσλειτουργιών αλλά και τη βελτίωση της ποιότητας εξυπηρέτησης του πολίτη. Με τον ψηφιακό μετασχηματισμό θα επιτευχθεί πληρέστερη, ταχύτερη και ποιοτική εξυπηρέτηση του πολίτη και των επιχειρήσεων και θα μειωθεί η γραφειοκρατία που ταλανίζει τη χώρα. Ταυτόχρονα, η απλούστευση των διοικητικών διαδικασιών θα μειώσει το υψηλό διοικητικό βάρος στο δημόσιο τομέα και σε πολίτες ή επιχειρήσεις.

3. What are the next plans, for the acceleration of the digital transformation in your business?

Οι έξυπνες πόλεις αποτελούν έργο πλαίσιο για την ανάπτυξη ψηφιακών εφαρμογών και την εγκατάσταση έξυπνου εξοπλισμού σε δήμους της χώρας, για την αναβάθμιση της δημόσιας ζωής, τη βελτίωση της καθημερινότητας των πολιτών, την προστασία του περιβάλλοντος, την αντιμετώπιση της κλιματικής αλλαγής και τη μείωση του ενεργειακού αποτυπώματος.

Ο Δήμος μας έχει ήδη προσαρμοστεί στην ψηφιακή εποχή και έχει κάνει σημαντικά βήματα όσον αφορά στην επικοινωνία με τους πολίτες και τη διευκόλυνση της καθημερινότητάς τους.

Ξεκινήσαμε με το «Citify Papagou – Holargos Smart City», που διακρίθηκε στο 4ο ετήσιο συνέδριο για τις «Έξυπνες Πόλεις» και τους «Ψηφιακούς Πολίτες – Smart Cities – Digital Excellences 2019». Είναι ένα σύστημα άμεσης καταγραφής προβλημάτων σε κάθε γειτονιά της πόλης με στόχο να δώσει τη δυνατότητα στον πολίτη να συμμετέχει ενεργά στην επίλυσή τους.

Παράλληλα, λειτουργούν στο Δήμο μας:

Η εφαρμογή GreenCity, που ενημερώνει τους πολίτες για τις δυνατότητες και τα σημεία ανακύκλωσης σε κάθε γειτονιά, για μια σειρά ανακυκλώσιμων υλικών και ειδών. Επιπλέον ο κάθε πολίτης μπορεί να παρακολουθεί live τα δρομολόγια συλλογής των απορριμμάτων, αλλά και αυτά της δημοτικής συγκοινωνίας.

Η εφαρμογή e-polis που ενισχύει τη συμμετοχή των πολιτών στις αποφάσεις του Δήμου.

Η **πλατφόρμας διαβούλευσης μέσω της ιστοσελίδας του Δήμου**

Το Σύστημα Γεωχωρικών Πληροφοριών (GIS), ένα ολοκληρωμένο σύστημα διαχείρισης και διάθεσης **χαρτών μέσω διαδικτύου**. Το σύστημα εξυπηρετεί αφενός τις εσωτερικές ανάγκες των Υπηρεσιών του Δήμου, αλλά στοχεύει κυρίως στην **εξυπηρέτηση του κοινού** (δημότες, μηχανικοί, επαγγελματίες, φορείς) και στην ενίσχυση της ελεύθερης πρόσβασης σε πληροφορίες και πολεοδομικά και άλλα δεδομένα.

Πρόσφατα, δημιουργήσαμε μια πλατφόρμα καταγραφής ιδεών (Post-It), ώστε με διαδραστικό τρόπο ο Δήμος να έρθει ακόμη πιο κοντά στους δημότες. Βασικό χαρακτηριστικό της νέας πλατφόρμας είναι η άμεση και εύκολη συγκέντρωση ιδεών και προτάσεων από τους πολίτες και επισκέπτες της πόλης.

Επιπλέον, ο Δήμος διαθέτει τον «Ψηφιακό Βοηθό», ο οποίος λειτουργεί μέσω της εφαρμογής Facebook Messenger αλλά και του viber και έχει τη δυνατότητα με τρόπο άμεσο, απλό και γρήγορο να δίνει αυτοματοποιημένες πληροφορίες στους χρήστες και να τους ενημερώνει για ποικίλα ζητήματα.

Τέλος, με σύστημα smart lighting και smart parking, ο Δήμος Παπάγου – Χολαργού βελτίωσε την καθημερινότητα των πολιτών.

4. **What is the envisaged end state and what are the main levers that will push towards that direction (EU funding? ΣΔΙΤ ? State Funding? Venture Capitals?)**

Με την απαραίτητη εργαλειοθήκη και τις αναγκαίες κατευθύνσεις έχουμε συντάξει το σχέδιο ψηφιακού μετασχηματισμού, προσαρμοσμένο στις τοπικές προκλήσεις αλλά και ενταγμένο ταυτόχρονα στις βασικές αρχές της νέας ψηφιακής στρατηγικής. Με

αυτό τον τρόπο διεκδικούμε χρηματοδότηση από ευρωπαϊκά συγχρηματοδοτούμενα προγράμματα, εθνικούς πόρους ή εξειδικευμένα πλαίσια χρηματοδότησης όπως π.χ. το πρόγραμμα «Αντώνης Τρίτσης».

5. **Is the pandemic a threat or rather an opportunity for digital transformation? Can improved digital governance in Greece be seen as one of the principal lasting consequences of the Covid-19 crisis? How can the Next Generation EU recovery package contribute to this strategic objective?**

Οι δυσκολίες της περιόδου της πανδημίας επιτάχυναν την ανάγκη για την εφαρμογή ψηφιακών λειτουργιών σε όλο τον δημόσιο τομέα. Η παύση αλλά και οι περιορισμοί εργασιών σε ορισμένους κλάδους, οι νέοι κανόνες υγιεινής και ασφάλειας, οδήγησαν σε έναν «ξαφνικό» ψηφιακό μετασχηματισμό, κατά τη διάρκεια του οποίου συγκεκριμένες λειτουργίες και διαδικασίες έπρεπε να αναμορφωθούν και να προσαρμοστούν σε ψηφιακό περιβάλλον. Υπηρεσίες τηλεκπαίδευσης, τηλεργασίας, ηλεκτρονικών συναλλαγών με το Δημόσιο (e-government), με τις επιχειρήσεις (e-commerce) αλλά και τον χρηματοπιστωτικό τομέα (e-banking), είτε δημιουργήθηκαν σχεδόν από το μηδέν είτε προσαρμόστηκαν και αναπτύχθηκαν περαιτέρω ώστε να συνεχιστεί με κάποιο τρόπο η κοινωνικοοικονομική ζωή της χώρας.

Σε αυτή την κατεύθυνση κινείται και μέρος του ευρωπαϊκού πακέτου ανάκαμψης, όπου μεταξύ άλλων, προβλέπεται ο ολοκληρωμένος ψηφιακός μετασχηματισμός των πόλεων.

> **Mr Angelos Amditis, Research Director at ICCS, Chairman of ERTICO-ITS Europe, Deputy Chairman at OASA, Vice President of ITS Hellas, member of the ALICE Executive Group, member of EYDAP S.A. Board of Directors**

1. **What are the main obstacles & difficulties of digital transformation in the public sector, in your opinion?**

If we are talking about the Greek reality, then the main challenges can be summarized in a. bridging research, technology and innovation b. creating a framework that promotes the synergies of the public sector with the industry and the services sector c. building the technical infrastructure d. raising awareness on the benefits of digitalization for the public sector e. establishing the procedures that promote and embrace innovation.

2. **What are the benefits you expect citizens & businesses will get through the digitalization of the public sector?**

In the link below, you may find several EU reports pointing to the benefits of the digitalization of the public sector:

https://digital-strategy.ec.europa.eu/en/policies/desi-digital-public-services

3. **What are the next plans, for the acceleration of the digital transformation in your business?**

In the field of mobility, digital transformation has already started and is complemented by a series of other technologies such as artificial intelligence, virtual reality, etc The future is smart mobility and currently research and innovation in mobility focus on a. issues of data – ensuring interoperability, quality, openness etv- b. connectivity (eg automated and connected vehicles) c. Developing MaaS services (eg new models for services and business)

4. **What is the envisaged end state and what are the main levers that will push towards that direction (EU funding? ΣΔΙΤ ? State Funding? Venture Capitals?)**

Our vision in the mobility sector leads us to the smart cities and smart societies of the future. This can only be realized and implemented through very hard work on the level of international cooperation in Europe, all actors involved in the European ecosystem of mobility: policy, research, industry, academia, business, innovation – oriented institutions, local authorities, governments etc should join their forces placing the citizens and societal needs at the center. Eu funding, state funding and venture capitals are all equally important actors in this effort.

5. **Is the pandemic a threat or rather an opportunity for digital transformation? Can improved digital governance in Greece be seen as one of the principal lasting consequences of the Covid-19 crisis? How can the Next Generation EU recovery package contribute to this strategic objective?**

The pandemic seems to have accelerated our way towards digitalization in Greece and although it has posed great challenges to the logistics and transport sector, it has also created opportunities to rethink our mobility needs and turn towards more sustainable and green solutions.

Please find more info in my article https://erticonetwork.com/looking-forward-to-2021-from-dr-angelos-amditis-ertico-chairman/ also here https://erticonetwork.com/mobility-in-the-new-era-after-the-covid19-pandemic/

➢ **Mrs Georgia Botsika, Cluster General Manager Greece & Cyprus, Printec Enterprise.**

1. **What are the opportunities of Industry 4.0? How does the current innovation model of manufacturing in Greece need to change to take the opportunities?**

Through our everyday business we see primarily the business-to-customer interactions being affected by technological change. Smart technologies like IoT, mobility, biometrics, and ePayments are changing the way businesses interact with their customers or potential customers either for informational purposes, or for specific transactions, monetary and non-monetary. An example is the digital onboarding of a new customer opening a bank account. We have seen this applied to both financial services as well as retail, but it is definitely true for many more industries as well. On the other hand we also see Business-to-business interactions being affected by technological change. Secure communication supports the digital transformation of the business. An example is the digital invoicing that applies to all industries.

2. **What is the most influential technology for digital transformation in the public sector to you?**

We've seen great progress in the way the public sector is using digital channels and mobile channels, but this is limited to those familiar with such technologies. For the people who are not as technologically savvy, the public sector is using (or is considering) other self-service channels such as kiosks, so as to improve customer experience but not exclude segments of the population. Another rising technology is eSignature, which can be used physically (on a pad) or digitally and can also enable remote transactions with great speed and security. The next step is the customer on boarding and service through digital (mobile)or semi digital (Self Service Machines) channels and the "Service by appointment" when it is necessary.

3. **How can the digital governance project create new opportunities for Greek businesses?**

With so many digitalization initiatives taken, companies in Greece finally have the opportunity to provide or even develop new technology solutions to provide to the public sector. What we see as an option for the future, is the possibility to create synergies with other industries (such as banks or even retailers etc) to service the public; in other words, use existing networks (branches, stores) as public service spots. We can see also remote service spots equipped by Self Service Machines.

4. **What are the changes required in the regulatory framework in order for the Public Sectors' digital transformation to become effective?**

The existing framework is wide and strict enough for most initiatives takes by the public sector. Still, we need to ensure that all processes – especially those including authentication or monetary transactions - are covered by standards like the ones that cover the financial industry. Existing regulatory frameworks (PSD2, GDPR, etc) covers most of them, but the are cases where they need to become more "strict", e.g. how often you renew your credentials in TaxisNet.

5. **How can local government leverage smart city technologies to stimulate new investments and economic development? What could central government be doing to assist local efforts?**

We have seen municipalities utilizing technologies for themselves, but in a rather isolated and parallel way. What the government could do is utilize technologies such as self-service channels across the country, to have one, unified experience for citizens. Examples are unattended payments for products or services, or info points that work with mobile, or electric chargers for car's charging in public buildings. Electronic ticketing is also a new way of supporting public events.

6. **Is the pandemic a threat or rather an opportunity for digital transformation? Can improved digital governance in Greece be seen as one of the principal lasting consequences of the Covid-19 crisis? How can the Next Generation EU recovery package contribute to this strategic objective?**

The pandemic offered a fast track education in digital channels for both users (consumers) and employees. Plus, all efforts by the government to modernize their processes will stay with us in the future. Finally, incoming funds can help businesses to further grow their technology offerings; startups can invent new offerings, or established business can keep up with the digital transformation of public sector and of individuals / consumers.

> ➢ **Milonopoulos Nikos, Associate Professor of Digital Business at ALBA Graduate Business School.**

1. **What are the opportunities of Industry 4.0? How does the current innovation model of manufacturing in Greece need to change to take the opportunities?**

The main opportunity of Industry 4.0 is the fusion of the physical systems (machines, buildings, warehouses, etc.) with their digital twins (their virtual representations in data, simulations, visualizations etc.). Taking advantage of the unlimited and almost unimaginable opportunities in this space requires first and foremost an investment in individual skills and organizational capabilities (data science, simulation, optimization, software development, wireless networks, cybersecurity, etc), which in turn will drive technology investments and subsequently process and product innovations.

2. **What is the most influential technology for digital transformation in the public sector to you?**

Open data and APIs. In other words, the capability to create opportunities for innovation, transparency and public accountability, and interoperability within the public sector and between the public and private sectors.

3. **How can the digital governance project create new opportunities for Greek businesses?**

First and foremost, greater efficiency in the public sector directly reduces transaction costs and overheads throughout the economy - by so doing it indirectly unleashes previously suppressed productivity, innovation and investment. Further, digital government processes introduce a more fair and level playing field for all, reducing opportunities for favorable treatment - another source of economic burden, what economists call influence costs. The net result of all the above improves what is known as the ease of doing business in the country - a key factor for incentivizing domestic investment and attracting foreign investment. Of course, this is not sufficient: predictability/certainty of the tax burden, distorted tax incentives, reliability and efficiency of the justice system, are of crucial importance, as are other sectors of the economy such as education, financial services, public infrastructures, logistics infrastructures and others. Reform and digitalization in these domains is also urgent and important.

4. **What are the changes required in the regulatory framework in order for the Public Sectors' digital transformation to become effective?**

I do not have the expertise to go into details in this question but see my comment in the previous question.

5. **How can local government leverage smart city technologies to stimulate new investments and economic development? What could central government be doing to assist local efforts?**

In broad terms, I would suggest that cities should invest in their smart infrastructures (with sensors everywhere) and open data, and refrain from investing in services that can be implemented by private initiatives. It is hard enough for cities to sustain their core services and infrastructures - they should be very selective about what new services they commit to. Instead, they should incentivize the private sector to develop services on top of public infrastructures and data. In this respect, the central government should do three main things in my opinion. First, impose a (digitally enabled) framework of complete public transparency and accountability around city finances and operations. Second, facilitate shared digital services that are common across cities (this is being done already but can be extended further). Third, set standards for data interoperability across cities for non-shared services that are not provided by the central government. The greatest challenge for cities will be their ability to maintain their digital infrastructures over time. Way too often in Greece, systems, and infrastructures are build without any organizational, financial, or human resource provision for their ongoing operation and maintenance. The experience in this field is dismal.

6. **Is the pandemic a threat or rather an opportunity for digital transf ormation? Can improved digital governance in Greece be seen as one of the principal lasting consequences of the Covid-19 crisis? How can the Next Generation EU recovery package contribute to this strategic objective?**

Of course, the pandemic was an opportunity. But that window is closing fast as the economy is already moving out of social distancing restrictions. Whether digital initiatives and services will have lasting benefits, remains to be seen - it is not given. It will depend largely on the extent to which politicians, the public sector, and citizens will be able to bypass or reverse some of the newly digitalized processes. I am not sufficiently informed to comment on the EU recovery package. Broadly, this kind of public funding should go to infrastructure and skills - not to services.

➢ **John Doxaras, Founder & CEO, Warply**

1. **What are the opportunities of Industry 4.0? How does the current innovation model of manufacturing in Greece need to change to take the opportunities?**

As in every digital transformation initiative, the optimization pillars are two and sit on both sides of a P&L. Optimizing product design/marketing (consumer-facing) functions and optimizing production/distribution. There are several opportunities in the first pilar since investment is relatively low, but higher opportunities on the second pilar since cost optimization is probably the low hanging fruit of digital transformation in the industry.

2. **What is the most influential technology for digital transformation in the public sector to you?**

In this stage of public sector transformation I see to technologies, RPA: relating to critical infrastructure long-lasting problems (e.g. digitizing physical documents of EFKA) and marketing automation software to deliver a citizen-first culture to public sector services.

3. **How can the digital governance project create new opportunities for Greek businesses?**

Two ways, cut costs by removing unnecessary bureaucracy and providing data to create new business models (e.g. centralized credit scoring via API for micro-loan disbursements).

4. **What are the changes required in the regulatory framework in order for the Public Sectors' digital transformation to become effective?**

Opening transactional data and services not just statistical data to 3rd parties. Two examples:

- open a vending API for Greek museums to 3rd party apps (from tour operators, local startups,. etc.)

- open a vending API for on-street parking to be consumed by Hertz or Avis app from tourists renting cars.

5. **How can local government leverage smart city technologies to stimulate new investments and economic**

development? What could central government be doing to assist local efforts?

Opening data and APIs not only informational but transactional as well.

Consolidating services in unified citizen interfaces

Leveraging data to extract and deliver knowledge to citizens

6. **Is the pandemic a threat or rather an opportunity for digital transf ormation? Can improved digital governance in Greece be seen as one of the principal lasting consequences of the Covid-19 crisis? How can the Next Generation EU recovery package contribute to this strategic objective?**

It's definitely a catalyst for exponential acceleration and adoption. It actually affects the most friction imposing factor of digital adoption, that is culture.

➢ **Apostolopoulos Charis, Chief Transformation Officer PMO Global Alliance.**

1. **What are the opportunities of Industry 4.0? How does the current innovation model of manufacturing in Greece need to change to take the opportunities?**

Technologies of digital transformation often include artificial intelligence (AI), machine learning, cloud computing, robotic process automation, data management and analytics solutions, edge computing, block chain and the Internet of Things (IoT). On the horizon three are other emerging technologies like 5G, currently under deployment in many countries. Of course it is worth mentioning the digital twin technologies. These technologies create virtual versions of real-word installations, processes and applications. In effect, they can be robustly tested to make cost-effective decentralised decisions.

The current innovation model of manufacturing in Greece needs to change without doubt. The issues of meritocracy and bureaucracy serve as two of the main obstacles. Organizations and individuals are forced to mitigate a range of systemic risks in an attempt to find sustainable solutions in the new digital era. Changes to the corporate strategy, culture, technology and organisational processes are inevitable as well as mandatory.

2. **What is the most influential technology for digital transformation in the public sector to you?**

Hard to choose one, as it depends on the use and benefits. However, I will say Artificial Intelligence (AI). AI will change the workplace and the jobs that humans do. Some jobs will be lost to AI technology, so humans will need to embrace the change and find new activities that will provide them the social and mental benefits their job provides. Of course there are a lot of benefits, as AI could help people with improved health care, safer cars and other transport systems, tailored, cheaper and longer-lasting products and services. Overall, AI can enable the development of a new generation of products and services. Either way, our future is digital.

3. **How can the digital governance project create new opportunities for Greek businesses?**

As long as the digital governance is transparent and the right professionals (top-notch skills and capabilities) are engaged it will do; otherwise it will be just announcements for prosperity and innovation without tangible results. Digital governance is a solid framework for establishing accountability, roles, and decision-making authority for an organization's digital presence. At a government level things are far more complex. If the governance framework is embraced with innovation then it can create several opportunities for Greek business.

4. **What are the changes required in the regulatory framework in order for the Public Sectors' digital transformation to become effective?**

The issue is rather complex. Due to the changing nature of technology the regulatory framework needs to keep changing as well. I guess, a closer cooperation among the government, universities and the industry will be a good start. Next, proper funding will be required. Citizens need to be educated on the benefits of Digital Transformation implementation.

5. **How can local government leverage smart city technologies to stimulate new investments and economic development? What could central government be doing to assist local efforts?**

Smart cities are not something new in the industry. If not wrong, the first smart city was Amsterdam and the creation of the virtual digital city back in 1994. Many things have changed since then. The central government can enforce for example an investment and regulatory framework and on top of that perhaps with PPP fund the business models. As an example, existing infrastructure for energy, water and transportation systems can be improved.

6. **Is the pandemic a threat or rather an opportunity for digital transformation? Can improved digital governance in Greece be seen as one of the principal lasting consequences of the Covid-19 crisis? How can the Next Generation EU recovery package contribute to this strategic objective?**

There are many reports on the issue which state that digital transformations were accelerated, so an opportunity. See the sources below.

https://www.iot-now.com/2020/07/23/104031-covid-19-has-sped-up-digital-transformation-by-5-3-years-saysstudy/

https://en.unesco.org/news/strategic-transformation-has-made-effective-response-covid-19-possible
https://home.kpmg/xx/en/blogs/home/posts/2020/07/digital-transformation-defines-new-reality.html
https://www2.deloitte.com/us/en/insights/topics/digital-transformation/digital-transformation-COVID-19.html
https://www.mckinsey.com/business-functions/strategy-and-corporate-finance/our-insights/how-covid-19-has-pushed-companies-over-the-technology-tipping-point-and-transformed-business-forever

Well yes, improved digital governance in Greece can be seen as one of the principal lasting consequences of the Covid-19 crisis as long as the framework is transparent as well as with tangible KPIs.

The Next Generation EU recovery package can contribute to this strategic objective if the package is distributed fairly on innovation and improvements that did not exist before. Time will show.

➢ Popi Tassiogiannopoulou, ODAP Project Manager for POS Retail & ERP Systems

1. *Ποιες ήταν οι προκλήσεις του εν λόγω έργου και πώς τις διαχειριστήκατε;*

Η υλοποίηση του ERP GALAXY και του POS RETAIL στον Οργανισμό Διαχείρισης και Ανάπτυξης Πολιτιστικών Πόρων του Υπουργείου Πολιτισμού είναι ένα αρκετά απαιτητικό και πολυδιάστατο έργο με αρκετές προκλήσεις κατά την διάρκεια υλοποίησης του, αφού πρόκειται για έργο εκσυγχρονισμού ενός φορέα ο οποίος λειτουργούσε κάτω από ένα συγκεκριμένο καθεστώς που βασιζόταν σε νόμο που είχε θεσπιστεί εδώ και 40 χρόνια και πλέον.

Σε ένα έργο τέτοιου βεληνεκούς κρίσιμος παράγοντας επιτυχίας είναι ο σπόνσορας (που συχνά είναι η διοίκηση του φορέα) που υποστηρίζει κάθε απόφαση είτε αυτή

έγκειται σε οργανωτικές αλλαγές είτε σε αλλαγές διαδικασιών. Όταν λοιπόν στον φορέα αυτό υπήρχαν συχνές αλλαγές στην διοίκηση (σε ένα turnover περίπου ετήσιο) οι αποφάσεις που έπρεπε να ληφθούν, είτε αναβάλλονταν, είτε άλλαζαν βάση νέων προτεραιοτήτων ή αναγκών, είτε ακυρώνονταν. Ο ρόλος του Project manager ήταν να προσπαθεί να αφουγκραστεί τις προτεραιότητες τις ανάγκες και την στρατηγική του φορέα σε κάθε δεδομένη στιγμή και με κάθε διοίκηση έτσι ώστε το έργο να υλοποιηθεί ομαλά και με τον καλύτερο δυνατό τρόπο στα χρονοδιαγράμματα που απαιτούσε ο ανάδοχος του έργου.

Κρίσιμος παράγοντας επιτυχίας σε ένα τέτοιο έργο φυσικά είναι και το ανθρώπινο δυναμικό. Είναι πολύ σημαντικό να μπορούν να οριστούν business owners που γνωρίζουν όχι μόνο την λειτουργία του φορέα και των διαδικασιών αλλά μπορούν να κατανοήσουν και την ανάγκη για αλλαγή και βελτίωση της υφιστάμενης κατάστασης. Η σύσταση του ανθρώπινου δυναμικού στον φορέα αυτό απαρτίζεται από χαμηλό αριθμό μόνιμου προσωπικού που γνωρίζουν το business του φορέα και από ένα αρκετά μεγάλο αριθμό υπαλλήλων με σύμβαση ορισμένου χρόνου (κάτω του 1 έτους) οι οποίοι εναλλάσσονται σε πολύ κοντινά τακτά χρονικά διαστήματα. Αυτό έχει ως αποτέλεσμα να χάνεται η γνώση και η δυναμική που ίσως έχουν δημιουργηθεί με μία ομάδα υπαλλήλων και να πρέπει να ξαναχτιστούν εκ νέου σε νέα πρόσωπα και πολλές φορές σε νέες οργανωτικές δομές. Η πρόκληση λοιπόν αυτή ήταν και είναι από τις πιο σημαντικές και ο τρόπος να διαχειριστείς μια τέτοια κατάσταση φυσικά είναι η καταγραφή των διαδικασιών, η παροχή αναλυτικών οδηγιών σε όλο το ανθρώπινο δυναμικό που να μπορούν να εφαρμοστούν από κάθε νέο υπάλληλο στον οργανισμό, και τέλος ο άμεσος και ευέλικτος χειρισμός τυχόν προβλημάτων που προέκυπταν κατά την υλοποίηση του νέου συστήματος έτσι ώστε οι κύριοι business owners να μπορούν να διαχειριστούν θέματα της καθημερινότητας τους και να μην δημιουργούνται bottlenecks εξαιτίας της υλοποίησης του συστήματος. Όταν τα προβλήματα ή οι δυσλειτουργίες του συστήματος επιλύονται σχετικά άμεσα οι χρήστες του συστήματος νιώθουν μεγαλύτερη ασφάλεια για τις διαδικασίες και την λειτουργία του νέου συστήματος και συνεργάζονται πιο αρμονικά.

Η υλοποίηση ενός νέου ERP φυσικά απαιτεί και τον απαραίτητο εξοπλισμό τόσο σε hardware όσο και σε software, οργανωμένες βάσεις δεδομένων και φυσικά επαρκή διαδικασία backup. Σε φορείς του Δημόσιου Τομέα είναι γνωστό ότι ο εξοπλισμός είναι παρωχημένης τεχνολογίας και αντικαθίσταται ή αναβαθμίζεται με σχετικά αργούς ρυθμούς σε σχέση με οργανισμούς του Ιδιωτικού τομέα. Αυτό έχει ώς αποτέλεσμα να δυσχεραίνονται διαδικασίες όπως αναβαθμίσεις του λογισμικού, παραμετροποιήσεις, δημιουργία test clients για δοκιμαστικά τεστς και άλλες πολλές λειτουργικότητες. Ο τρόπος για να διαχειριστείς μια τέτοια κατάσταση είναι φυσικά σε συνεργασία με την διοίκηση να υπάρχει μια ιεράρχηση των αναγκών σε καίριες θέσεις του οργανισμού για να διασφαλιστεί η ομαλή λειτουργία του φορέα παράλληλα με την υλοποίηση του νέου συστήματος.

Εκτός από τις προκλήσεις που αντιμετωπίστηκαν από εσωτερικούς παράγοντες δεν πρέπει να παραβλέψουμε και τις σημαντικότατες προκλήσεις εξωγενών παραγόντων

όπως αυτός της πρόσφατης πανδημίας όπου για μεγάλα χρονικά διαστήματα υπήρξε το καθεστώς είτε αδειών ειδικού σκοπού σε προσωπικό σε καίριες θέσεις στην οργανωτική δομή του φορέα , είτε το καθεστώς τηλεργασίας το οποίο δυστυχώς στον δημόσιο τομέα δεν είναι τόσο αποτελεσματικό όσο στον ιδιωτικό τομέα διότι δεν υπάρχουν οι υποδομές (δίκτυα, VPN γραμμές επικοινωνίας κλπ). Αυτό είχε ως αποτέλεσμα να καθυστερούν τα χρονοδιαγράμματα είτε των εκπαιδεύσεων του προσωπικού, είτε των ελέγχων λειτουργικότητας του συστήματος είτε του σχεδιασμού σωστής παραμετροποίησης για τα υποσυστήματα προς υλοποίηση. Με επιμονή και ιεράρχηση των αναγκών και των προτεραιοτήτων υλοποιήθηκε η πλειοψηφία των απαιτήσεων του φορέα έχοντας φυσικά κάνει αρκετά τεστ στις καθημερινές διαδικασίες και έχοντας προσαρμόσει πλέον αρκετές διαδικασίες στα νέα δεδομένα του συστήματος.

2. **Ποια είναι τα οφέλη τα οποία θα απολαμβάνει ο οργανισμός από την υλοποίηση του εν λόγω έργου;**

POS RETAIL/GALAXY

Το σύστημα λιανικής πώλησης POS RETAIL/ GALAXY που υλοποιήθηκε σε 8 σημεία πώλησης (πωλητήρια αρχαιολογικών χώρων και μουσείων – Ακρόπολη, Εθνικό Αρχαιολογικό Μουσείο, Βυζαντινό Χριστιανικό Μουσείο, Αρχαία Αγορά, Ολυμπιείο, Κνωσσός, Μουσείο Ηρακλείου) καθώς επίσης και στην αποθήκη εκμαγείων στο Ρέντη, έφερε μια νέα πνοή τόσο στην εικόνα των πωλητηρίων προς τον πελάτη όσο και εσωτερικά στην οργάνωση Backoffice του φορέα η οποία έχριζε σημαντικής βελτίωσης.

Συγκεκριμένα ο πελάτης που επισκέπτεται το πωλητήριο του μουσείου ή του Αρχαιολογικού χώρου μπορεί να ενημερωθεί από τον πωλητή άμεσα για το αν υπάρχει σε απόθεμα ένα είδος είτε στο συγκεκριμένο πωλητήριο είτε σε άλλο online πωλητήριο κάτι που στο παρελθόν ήταν σχεδόν αδύνατο. Υπάρχουν BARCODE SCANNERs στα πωλητήρια αυτά όπου ο πωλητής σκανάρει το είδος και εκδίδει επιτόπου απόδειξη λιανικής πώλησης ή τιμολόγιο (ακόμα και με αυτόματη έκπτωση αν αυτή έχει καταχωρηθεί από την κεντρική υπηρεσία του φορέα) παίρνοντας σήμανση από φορολογικό μηχανισμό συνδεδεμένο με την ΑΑΔΕ . Με την έκδοση των παραστατικών αυτών ενημερώνεται αυτόματα το ταμείο του πωλητηρίου για τις εισπράξεις είτε με πιστωτική κάρτα είτε με μετρητά και ο διαχειριστής του πωλητηρίου μπορεί να ελέγξει ανα πάσα στιγμή με όλες τις αναφορές που βγαίνουν από το σύστημα τις εισπράξεις και τις συμφωνίες ταμείων.

Επίσης υπάρχει αυτόματη διασύνδεση με το ERP GALAXY της κεντρικής υπηρεσίας δίνοντας την δυνατότητα στην διοίκηση σε χρόνο online real time να γνωρίζει τις πωλήσεις από το κάθε πωλητήριο ανά κωδικό είδους είτε για είδη παρακαταθήκης είτε για είδη ΟΔΑΠ. Κάθε νέο είδος που δημιουργείται, παράγεται ή διακινείται από και προς τα πωλητήρια καταγράφεται στο ERP GALAXY της κεντρικής υπηρεσίας και

μεταφέρεται μέσω connector στα πωλητήρια αυτά. Βασικό όφελος της υλοποίησης αυτής είναι η πλήρης διαφάνεια του φορέα σε πωλήσεις, αποθέματα, φυσικές απογραφές που καταγράφονται πλέον στο σύστημα από τους διαχειριστές πωλητηρίων καθώς επίσης και η διαχείριση εισπράξεων και η συμφωνία με τις τράπεζες . Φυσικά η σαφής βελτίωση της εικόνας των πωλητηρίων προς τον εξωτερικό πελάτη είναι κάτι που βελτίωσε την εικόνα όχι μόνο του Οργανισμού Διαχείρισης και Ανάπτυξης Πολιτιστικών Πόρων (ΟΔΑΠ) αλλά και του Υπουργείου Πολιτισμού, διότι στο παρελθόν όλες οι διαδικασίες καταγραφής πωλήσεων και εισπράξεων ήταν χειρόγραφες χωρίς να υπάρχει ο απαραίτητος έλεγχος και χωρίς να διασφαλίζεται και η σωστή και έγκαιρη καταγραφή των εσόδων των πωλητηρίων αυτών.

ERP/GALAXY

Τα οφέλη της υλοποίησης της πλειοψηφίας των υποσυστημάτων του ERP GALAXY στην κεντρική υπηρεσία του ΟΔΑΠ είναι ήδη ορατά και πολύ σημαντικά .

Καταρχήν δημιουργήθηκε μία γέφυρα διασύνδεσης από το σύστημα E-TICKET (ηλεκτρονικό εισιτήριο) που έχει υλοποιηθεί σε 8 αρχαιολογικούς χώρους με μεγάλη επισκεψιμότητα, με το σύστημα ERP GALAXY με αποτέλεσμα να αποτυπώνονται και να καταχωρούνται αυτόματα τα έσοδα του Οργανισμού από πωλήσεις εισιτηρίων σε αρχαιολογικούς χώρους με ηλεκτρονικό εισιτήριο χωρίς παρέμβαση από χρήστες και βέβαια χωρίς καμία χειρόγραφη διαδικασία. Με τον τρόπο αυτό η διοίκηση του ΟΔΑΠ έχει άμεση πληροφόρηση των εσόδων αυτών που απαρτίζουν το μεγαλύτερο μέρος των εσόδων.

Παράλληλα δημιουργήθηκε βάση δεδομένων για όλα τα ακίνητα του Υπουργείου Πολιτισμού που διαχειρίζεται ο Οργανισμός Διαχείρισης και Ανάπτυξης Πολιτιστικών πόρων, έτσι ώστε να παρακολουθούνται αποτελεσματικά τα έσοδα που προκύπτουν από τις μισθώσεις των ακινήτων αυτών καθώς επίσης και οι μακροπρόθεσμες απαιτήσεις του φορέα από τους εκμισθωτές τους με αυτοματοποιημένη διαδικασία βάση των συμβάσεων εκμίσθωσης. Πριν την υλοποίηση του υποσυστήματος ακινήτων όλη η παρακολούθηση των εσόδων αυτών -που είναι σημαντικό μέρος των εσόδων του φορέα- γινόταν με χειρόγραφη διαδικασία. Η ίδια ακριβώς υλοποίηση πραγματοποιήθηκε και για τα εκμισθωμένα αναψυκτήρια σε ακίνητα που βρίσκονται στους αρχαιολογικούς χώρους.

Σημαντικά οφέλη προέκυψαν από την υλοποίηση επίσης της εμπορικής διαχείρισης όλων των ειδών που διαχειρίζεται ο οργανισμός (ειδών ΟΔΑΠ και ειδών σε παρακαταθήκη) όπου υπάρχει ενιαία βάση δεδομένων με ενιαία κωδικοποίηση των ειδών η οποία συνδέεται με τα πωλητήρια των αρχαιολογικών χώρων και την αποθήκη του Οργανισμού που βρίσκεται στο Ρέντη. Όλα τα παραστατικά διακίνησης εκδίδονται πλέον από το ERP -ενώ πριν την υλοποίηση όλα τα παραστατικά ήταν χειρόγραφα- έχοντας σαν αποτέλεσμα την πλήρη διαφάνεια και οργάνωση της διακίνησης και διαχείρισης των ειδών. Φυσικά δημιουργήθηκαν πολύ χρήσιμες αναφορές όπου η διοίκηση καθώς επίσης και τα τμήματα πολιτιστικών ειδών μπορούν να

παρακολουθούν τις πωλήσεις, τα αποθέματα των ειδών καθώς επίσης και τις εγκρίσεις με αριθμό πρωτοκόλλου που δίνονται από το Υπουργείο Πολιτισμού για την διακίνηση και διανομή ειδών παρακαταθήκης στα πωλητήρια των αρχαιολογικών χώρων.

Όσον αφορά την διαχείριση των εξόδων του φορέα και την αποτύπωση τους με τους κανόνες και τις εγκυκλίους του Δημόσιου Λογιστικού η υλοποίηση αν και πολύπλοκη ήταν αρκετά αποτελεσματική διότι έγινε αυτοματοποίηση αρκετών διαδικασιών που στο παρελθόν ήταν χειροκίνητες.

Κάποιες από τις διαδικασίες που αυτοματοποιήθηκαν ήταν οι ακόλουθες :

- ✓ Στοχοθεσία Προϋπολογισμού
- ✓ Απόδοση Φόρων και κρατήσεων δαπανών
- ✓ Απόδοση φόρων και κρατήσεων μισθοδοσίας ΟΔΑΠ και Υπαλλήλων ΥΠΠΟΑ
- ✓ Εκτυπωτικά και παραστατικά Δημοσίου Λογιστικού (φόρμα ενταλμάτων, καταστάσεις ενταλμάτων προς τον Επίτροπο, Κατάσταση πληρωμών)
- ✓ Αναφορές φόρων για ΑΑΔΕ
- ✓ Δικαιολογητικά ενταλμάτων
- ✓ Αυτόματη διασύνδεση Δημόσιου Λογιστικού με Γενική Λογιστική

3. Ποια θεωρείτε ότι είναι τα επόμενα βήματα/έργα προς τον ψηφιακό μετασχηματισμό του οργανισμού?

Σίγουρα η ολοκλήρωση της υλοποίησης των υπολοίπων υποσυστημάτων του ERP είναι κρίσιμης σημασίας . Συγκεκριμένα η υλοποίηση κοστολόγησης των αποθεμάτων θα δώσει στον φορέα την κατάλληλη πληροφόρηση όσον αφορά το περιθώριο κέρδους από τις πωλήσεις των ειδών (είτε παραγωμένων είτε αγοραζομένων) και με βάση τις πληροφορίες αυτές θα μπορεί η διοίκηση να διαμορφώνει αντίστοιχα την εμπορική πολιτική του φορέα κάτι που στην υφιστάμενη κατάσταση είναι σχεδόν ανέφικτο.

Συμπληρωματικά η υλοποίηση της αυτόματης διαδικασίας παραγωγής στο ERP θα βελτιώσει σημαντικά τα κόστη παραγωγής καθώς θα υπάρχει καταγραφή όλων των αναλώσεων και των εντολών παραγωγής με αναλυτικά φασεολόγια και τεχνικές προδιαγραφές ανα είδος.

Επίσης η υλοποίηση της διαχείρισης των συμβάσεων προμηθειών ειδών, υλικών και υπηρεσιών στο ERP , θα συνεισφέρει αρκετά στην βελτίωση της οργάνωσης των διαδικασιών προμηθειών όπως οι διαγωνισμοί που θα οδηγούν σε αυτόματη δημιουργία αιτημάτων προμήθειας , καθώς επίσης και η αυτοματοποιημένες εγκριτικές ροές όπου οι εγκρίνοντες με πολύ απλά βήματα θα μπορούν να εγκρίνουν την δαπάνη μιας προμήθειας ακόμη και αν δεν βρίσκονται στον φορέα (μέσω ενός κινητού smartphone ή tablet)

Επιπρόσθετα θεωρώ πολύ σημαντική την επέκταση υλοποίησης του συστήματος λιανικής πώλησης POS RETAIL GALAXY στην πλειοψηφία των πωλητηρίων

(τουλάχιστον στα πωλητήρια με σημαντικό κύκλο εργασιών) έτσι ώστε να εκσυγχρονιστεί και η εικόνα των πωλητηρίων αλλά και να βελτιωθεί η οργάνωση του back-office, με πλήρη διαφάνεια και online real time ενημέρωση στη κεντρική υπηρεσία.

Στα πλαίσια εκσυγχρονισμού των πωλητηρίων και των πωλητέων ειδών και βλέποντας τις τάσεις της αγοράς που στρέφονται όλο και περισσότερο σε online κανάλια , θα ήταν σημαντικό να υλοποιηθεί και μια πλατφόρμα e-shop με αυτόματη διασύνδεση φυσικά στο ERP και την αποθήκη των ειδών όπου θα μπορεί ο κάθε πελάτης να παραγγείλει ηλεκτρονικά οποιοδήποτε από τα πωλητέα είδη επιθυμεί και να του αποστέλλεται στον χώρου του με ασφάλεια και όλα τα απαραίτητα παραστατικά.

Τέλος, εξίσου σημαντική είναι και η επέκταση υλοποίησης του ηλεκτρονικού εισιτηρίου e-ticket και σε άλλους αρχαιολογικούς χώρους με σημαντική επισκεψιμότητα έτσι ώστε να υπάρχει μεγαλύτερη προσέλκυση του τουρισμού καθώς επίσης και B2B πελατών και φυσικά να υπάρχει η κατάλληλη διασύνδεση με το ERP έτσι ώστε να υπάρχει η απαραίτητη εικόνα και στην διοίκηση του φορέα.

➢ Pantelis Tsironis, ODAP Project Manager for e-Ticketing & Access Control Systems

1. Ποιες ήταν οι προκλήσεις του εν λόγω έργου και πώς τις διαχειριστήκατε;

Η παροχή μιας Υπηρεσίας ηλεκτρονικών αγορών για το Ελληνικό Δημόσιο είναι πρόκληση από μόνη της !

Εφαρμόστηκε για πρώτη φορά η ηλεκτρονική αγορά και όχι αποκλειστικά η πληρωμή υποχρεώσεων, ειδικά για ένα ΝΠΔΔ, Φορέα Γενικής Κυβέρνησης του Κράτους.

Χρειάστηκε να ξεπεραστούν νοοτροπίες και αρκετά, μη ουσιαστικά, γραφειοκρατικά ζητήματα.

Αυτά αντιμετωπίστηκαν με πολιτική βούληση και αντίστοιχες παρεμβάσεις, στο μέτρο του δυνατού και με γνώμονα το Δημόσιο συμφέρον.

Κυρίως όμως αντιμετωπίστηκαν γιατί βρέθηκαν άνθρωποι που πίστεψαν στην αναβάθμιση των Υπηρεσιών, είχαν τη διάθεση να συνεργαστούν, ακόμη και τα προσόντα για να λειτουργήσει το Έργο.

Τα κυριότερα θέματα που προέκυψαν ήταν εσωτερικής επικοινωνίας και αρμοδιοτήτων.

Αυτά τα θέματα δεν αντιμετωπίστηκαν ποτέ επαρκώς.

Η συνεργασία με τον Ανάδοχο του Έργου, καθόρισε πολλές φορές την επιτυχημένη επικοινωνία ενός ζητήματος αλλά και τη διαδικασία επίλυσής του.

2. **Ποια είναι τα οφέλη τα οποία θα απολαμβάνει ο οργανισμός από την υλοποίηση του εν λόγω έργου?**

Η Ψηφιοποίηση των Υπηρεσιών δίνει τη δυνατότητα στους χρήστες (Επισκέπτες – Πολίτες – Υπάλληλοι) να έχουν άμεση πρόσβαση, αξιοπιστία και έλεγχο, σε όποια πλευρά κι αν βρίσκονται.

Η διασφάλιση του Δημόσιου χρήματος μέσω των ηλεκτρονικών πληρωμών και εφαρμογών, έχει πολλαπλά οφέλη για ένα Δημόσιο Οργανισμό.

Τα χρήματα πιστώνονται άμεσα στους Τραπεζικούς Λογαριασμούς του Οργανισμού, χωρίς κάποια ανθρώπινη ενέργεια.

Εξοικονομούνται δαπάνες για χρηματαποστολές.

Διαφάνεια των συναλλαγών και αποτύπωσή τους σε αντίστοιχο Λογιστικό Σύστημα σε ταυτόχρονο σχεδόν χρόνο.

Εξαγωγή ασφαλών οικονομικών και στατιστικών στοιχείων, οποιαδήποτε στιγμή.

Προκύπτει επίσης και εσωτερική αναδιάρθρωση των Υπηρεσιών του Οργανισμού, σωστότερη κατανομή του Προσωπικού σύμφωνα με τις νέες ανάγκες, κάλυψη θέσεων εργασίας που δημιουργούνται λόγω ειδικότητας και αντικειμένου εξειδίκευσης, πάντα με σκοπό τη βέλτιστη Διαχείριση των Πολιτιστικών Πόρων.

Δείχνει μια σύγχρονη και πιο ευέλικτη εικόνα του Οργανισμού στον τομέα της Παροχής Υπηρεσιών.

3. **Ποια θεωρείτε ότι είναι τα επόμενα βήματα/έργα προς τον ψηφιακό μετασχηματισμό του οργανισμού?**

Η ένταξη ακόμη περισσότερων σημαντικών Μνημείων, Μουσείων και Αρχ/κών χώρων στο e-Ticket.

Η πλήρης εφαρμογή του ERP σε όλες τις δραστηριότητες του Οργανισμού.

Η παροχή ηλεκτρονικών ξεναγήσεων μέσω αντίστοιχων εφαρμογών.

Η δημιουργία e-shop, διαδικασία που γνωρίζω πως είναι σε φάση υλοποίησης.