

Prospects of the Digital Transformation of the Greek Public Sector through Private-Public Partnerships: A Perception Study

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Abstract

The purpose of this paper is to examine the extent that the evolution of Greek public administration is important in the interest of society, the extent to which Greek society is able to assimilate and support the digital transformation, as well as the benefits and weaknesses of Public-Private Partnerships projects in the context of the effort of digital transformation of the Greek public sector. The survey was conducted through a questionnaire that involved 85 employees and through 11 interviews with executives working in senior positions. The results showed that the digital transformation of the Greek public sector brings social benefits, which increase the quality of public services. The Greek public sector has not yet completed its digital transformation, although remarkable efforts have been made in the last few years. The digital transformation will lead to the opening of new jobs and the existing civil servants have to be properly trained. According to the results of this research, the framework of PPP projects is characterized by several shortcomings and weaknesses, such as time delays and bureaucratic procedures. In Greece, compared to other European countries, double the contracting time of PPP projects is required, but both the public and private sectors benefit from these partnerships. The public sector acquires an alternative source of funding and expertise, and the private sector can develop its innovation and improve its extroverted character toward global markets.

Keywords

Public-Private Partnerships, Digital Transformation, Greek Public Sector

1. Introduction

The scope of this paper is to study the prospects of digital transformation through Public-Private Partnerships (PPPs) in the public sector. In order to fulfil this purpose, a mapping of the implementation stages, as well as the partnerships of the different operational functional models (public and private sector) for the implementation of PPP projects, is sought.

In particular, the purpose of this research is to study the prospect of developing innovative public sector services for the benefit of society as a whole. This harmonious coexistence should give a positive sign to the relationship between the citizen and digital governance. Through this study, the objective is to compare the relationship between citizens and public administration, and how citizens themselves envision it after the transformation.

The “Digital Transformation Bible” with a reference plan for 2021-2025 largely defines the Greek Ministry of Digital Governance’s vision for this transition. It seeks to develop projects and services that can horizontally integrate public administration with the whole of society, including business.

This study wants to investigate the extent to which bureaucracy is reduced as a result of such partnerships. In addition, examines the degree of automation of public services after the first stage of the project, which is digitization. The degree of satisfaction with the use of digitized services is analyzed, and motivated by the use of this data for productive business development. Finally, the reconfiguration of the working framework during and after the implementation of the digital transformation is examined, as well as the utilization of human resources in alternative public services.

PPP projects are described as projects that involve various executions of partnerships, of short or long duration and concessions to the private sector, which are carried out in order to serve a specific need of society (Margiono, 2020).

Such projects include, for example, telematics, electronic ticketing, waste treatment plants in different regions of Greece, school facilities, Athens International Airport, fire stations and other similar projects. Public authorities, according to the legislative framework (Law 3389/2005), can be Local Authorities, public sector organizations, ministries, regions or public limited companies, in which the Greek State is the main shareholder.

The implementation of PPP projects involves the following stages. The first stage is to answer the question of the need for each project to be implemented by a public organization. The next stage is the planning of the pre-contractual process, which includes the entire project design, including the budget, and also the funding organization (Polyzos, 2019). Then, the project is posted on the ESIDIS (National System of Electronic Public Procurement) and the submission of offers by the various companies that express interest in participating, where based on the combination of the best price and quality characteristics, the respective company is selected. Finally, the final stage concerns the implementation of the project by the contractor.

In Greece, research on digital transformation and the implementation of PPP projects is still at an early stage. Our study seeks to contribute to this knowledge area in the preparation of relevant projects and development services based on international experience, as well as how to develop relevant projects based on international experience.

The main research questions that this study seeks to answer are whether digital transformation is a driver of growth, or a tool that will support Greece to smoothly welcome the fourth industrial revolution. Furthermore, it seeks to answer whether the development of digital services, such as solemn declarations, authorizations, registry deeds, etc., as well as the further development of a relatively new digital platform, such as <https://www.gov.gr/>, can contribute not only to the service of customers-citizens, but also of businesses. In addition, the element of unification of public organizations and its benefits, as well as difficulties that may arise during the stages of this process, will be highlighted. Finally, an attempt will be made to read the degree of implementation of digital services in the primary and secondary production sectors.

More specifically, the following research questions were defined in the context of managing the topic of this study:

To what extent can the development of digital services and the development of the digital platform of gov.gr contribute to the joint service of citizens and businesses? Will the unification of public administration work beneficially? What difficulties may arise during the completion stages of this process? Through the process of digital transformation, are PPP-type contracts an alternative financial instrument for the implementation of public services?

Our research is organized as follows: In Chapter 2, the theoretical part is covered. In Chapter 3, basic methodological issues concerning the conduct of both quantitative and qualitative research are presented. In Chapter 4, the results of the quantitative and qualitative research are presented. Finally, in Chapter 5, the final conclusions, limitations and weaknesses of this research are presented, as well as suggestions that are considered worthy of future research and that are consistent with the focus of this study.

2. Literature Review and Theoretical Framework

2.1. Digital Transformation

On a global basis, public administration is the subject of strong negative criticism of its bureaucratic procedures. Often, the view is expressed that there is a lack of flexibility behind outdated bureaucratic systems and procedures. Their existence is an inhibiting factor in promoting innovative reforms and assisting the development of technologically advanced approaches that lead to the successful digital transformation of the public sector (Al-Ruithe et al., 2018; El-Khatib & Al-Sadi, 2023).

In order to promote innovations in public administration, a prerequisite is the presence of corresponding initiatives, coming either from the existing political

system, from the prevailing legislation, or from pressures exerted against politicians (Mergel et al., 2019).

The promotion of technological innovation in public administration can be achieved through changes in the leadership of a public organisation, as well as through the resulting effects of crises. The existence of internal problems can be a reason for enhancing innovation in public services, at the moment when the use of new technologies becomes imperative (Alvarenga et al., 2020).

In order to enable the successful digital transformation of the public sector, a bottom-up approach is necessary at the hierarchical levels of the public organisation. In addition, it should be emphasized that each innovation-related team operating in a public service ends up following differentiated strategic approaches toward innovation (Kokkinakos et al., 2016).

The development of innovation levels and digital transformation in public administration is not only a national but also an international priority. This can be seen, from the so-called Public Sector Innovation Declaration, signed by a total of thirty-five OECD member states in the year 2019 (Larsson & Teigland, 2019). The ultimate objective of this declaration is to highlight innovation as an integral part of the strategic functioning of public organisations and services, as well as of the day-to-day professional responsibilities of civil servants. Through this declaration, a common position is expressed, which is directly related to governmental issues and how governments should offer support and assistance in optimising and promoting innovation (Larsson & Teigland, 2019). This is the only way to cultivate fertile ground for exploiting new opportunities that arise in the external environment in which public services operate.

The OECD can support the public sector of its member states, both at planning and legislative level, through the drafting of specific contracts (Rot et al., 2020). Briefly, some points highlighted in the declaration on innovation are the presence of its acceptance and enhancement in public administration, the encouragement of public sector human resources, the strengthening of new collaborations and different approaches, the support of research and development, as well as the transfer of knowledge, know-how and good practices (Scupola, 2018).

In order to meet these requirements, the Greek public sector has made efforts to develop a digital policy, with the ultimate aim of fully completing the digital transformation (Larsson & Teigland, 2020). Despite the improvement in the service delivery of Greek public organizations over the last few years, the Greek public administration still has much room for improvement until it perfects its digital transformation.

One of the key efforts to complete the digital transformation of the Greek public administration is the establishment of the **Ministry of Digital Government** (2021). In it, a large part of important telecommunications and IT structures, inextricably linked to the provision of digital services to all citizens, were concentrated. This led to the development of the so-called digital portal gov.gr. This portal reflects the new digital face of the Greek public administration, in

terms of the relations between citizens/businesses and the Greek public sector (Kitsios et al., 2021).

An additional objective of the digital transformation of the Greek public administration, which is already being implemented, concerns the establishment of the so-called Citizen Service Centres (CSCs). The CSC are recognized institutions of the Greek public sector and their activity is purely concerned with the service of citizens on issues related to their transactions with the Greek public administration. However, in order to make this service even more efficient, further improvement of the digital transformation of the CSCs is required, at a time when it is necessary to make new digital tools available to Greek citizens (Loukadounou et al., 2020).

The Digital Transformation Bible is another example that demonstrates that the Greek public sector has already entered a digital transformation path. It is clear that the Covid-19 pandemic has positively influenced the transition to digital transformation and accelerated the implementation processes. The bible was formulated during 2020 and reflects a comprehensive framework for the adoption of digital transformation by the Greek public administration. Through this, the digital transformation of the Greek public sector includes as sub-objectives: the secure, rapid and highly reliable access of citizens to the internet; the creation of a digital state, through which quality digital services will be provided to all citizens, the development of digital literacy of citizens, the transformation of Greek businesses into digital ones; the support of digital innovations, the digital and efficient use of data, which is inextricably linked to the public sector, as well as the integration of modern technological innovations in all economic sectors (Piotopoulos & Sakkopoulos, 2021).

2.2. Public-Private Partnerships (PPPs)

Based on the legislative provisions of Law 3389/2005, public-private partnerships are described as an institution through which the cooperative framework that should prevail between the two sectors is defined. The institution of partnerships started as early as the 1990s in the United Kingdom. Their ultimate aim was to bring about a consolidation of the country's fiscal situation without the restrictive impact of the respective public investment programmes (Hodge & Greve, 2007).

In the case of the United Kingdom, through the implementation of corresponding legislative provisions, there was provision for the possibility of private sector participation in the financial support of projects under public investment programmes. This was a financing scheme characterised by a high level of innovation. It has therefore been extended to other European countries. The immediate benefits that resulted from these partnerships were to increase efficiency levels and enhance the socio-economic utility of the projects to be implemented (Gerrard, 2001; Leigland, 2018).

While public-private partnerships were constantly being implemented, they

were conceptually clarified in the European Union's Green Bible. Reference was made to partnerships between the private and public sectors for the purposes of securing financial support, management issues, construction and renovation, as well as the provision of services and maintenance of existing infrastructure. In a European context, the legislative scope of more general provisions was intertwined with Community contract law (Broadbent & Laughlin, 2003).

In Greece, according to the provisions of Law 3389/2005, these partnerships concern cooperative agreements and are reflected in written contracts between public entities and private business entities. Their main objective is the provision of services or the execution of works. These cooperative arrangements are long-term. Through these schemes, financial support, maintenance, construction and operation of specific infrastructures is ensured, as well as the provision of services to different sectors of the economy.

In the context of public-private partnerships, the two sectors play different roles. More specifically, the public sector's obligation is to clearly define the specifications of the project in question and to carry out the tendering process. This process is completed by the selection of the private sector body deemed to be the most appropriate. In addition, the public sector assumes the responsibilities of evaluating the process of the bids submitted by private entities (Manos et al., 2014; Pongsiri, 2002).

As regards the role of the private sector in these partnerships, it is the responsibility for carrying out all the studies required for the successful construction of the project in question, as well as for securing the necessary financial support. The private sector's responsibilities include the management, maintenance and the efficient and proper operation of the specific project for which the partnership has been established (Roumboutsos & Anagnostopoulos, 2008). The benefits of the partnership are many, as it allows for the optimal use of the expertise and high levels of efficiency and effectiveness that accompany the private sector. In addition, an additional benefit of these partnerships is that the public sector does not lose its supervisory role (Fantozzi et al., 2014).

Through partnerships it is possible to build high quality projects and provide equally high-quality services to all citizens. Through public-private partnerships, it is possible to enhance the growth of the country's economy, at the same time as leveraging private resources towards development projects (Ke et al., 2010). Also, through these partnerships the ownership of fixed assets is still in the public sector. This fact demonstrates the continuation of not only the supervisory, but also the regulatory role it plays. Thus, regardless of whether a country goes through periods of fiscal crises, this cannot undermine the delivery of high-quality public works through public-private partnerships (Engel et al., 2013).

2.2.1. Legislative Framework

The implementation of PPP projects started in Greece after the adoption of Law 3389/2005. This law was a necessity for the system for the institutionalization of

joint operations and partnerships between the public and private sectors. Failures of the past, due to the non-legally established enforceable procedure were attempted to be eliminated and harmonization with international PPP project practices was made (Spirou & Koumpli, 2010).

The main characteristics of the Law 3389/2005 are the following (Spirou & Koumpli, 2010):

- The project must involve the provision of services or the completion of certain infrastructures which are under the jurisdiction and ownership of the public entity concerned.
- These contracts must involve the participation of the private operator with its own financial resources. Either through financing from financial institutions or through equity.
- The assumption of the financial risk must be borne by the private partner.
- The cost of each contract should not exceed 500 million.

The Law 4412/2016 completed the framework for the formulation and operation of the pre-contractual procedures that govern not only PPP-type contracts, but also any contract for the provision of services or supplies to the public sector. It defined the whole process from the approval of a project, its posting on the platform of public tenders, the procedure for the participation of private bidders in a tender and the methodology for the selection of the lowest bidder (Karypidou & Maditinos, 2021).

From the perspective of the European Union, the Green Bible codifies all forms of PPPs and identifies their specific characteristics (Verhoest et al., 2013).

The Community Directive 2014/23 defines concessions and differentiates them from works and service contracts and defines the procedures for open or restricted tendering. For contracts with low budgetary costs, open tendering via a platform is not considered necessary. Thus, the entity can address itself to private entities in a tender procedure without the demanding and bureaucratic procedure of open tenders. The above does not apply to PPP contracts. Furthermore, through this directive, the acceptance of private entities of the European Single Procurement Document (ESPD) is determined (Telles & Butler, 2014). The Directive 2014/25 of the European Parliament deals with the procurement of entities in the water, energy, transport and postal services sectors, including PPP projects (Metallinos, 2020).

2.2.2. Good Practices from Other Countries

A prime example of good practice in public-private partnerships is Great Britain. The study by Geddes (2017) states that their success is directly related to the degree of efficiency that characterises public procurement, the transparent nature of the procedures followed and the high levels of organisation of public administration. Moreover, the adequate organisation of public structures ensures both the efficient and rational completion of projects (Deakin, 2002). An additional important determinant of the success of public-private partnerships is the issue

of social acceptance of these projects (Falconer & McLaughlin, 2000).

An additional example of good practice in public-private partnerships is the Netherlands. Partnerships do not take a particular form in terms of how they are implemented but are adapted to the existing organizational structures of the country's public sector (Klijn, 2009). PPPs, in the case of the Netherlands, have been strengthened by the presence of strong pressures to reduce the role of the state. The majority of projects that implemented through partnerships, are developed through laxes rather than strict organisational relationships between the parties involved (Koppenjan & de Jong, 2018). A prime example of a successful public-private partnership in the Netherlands is the completion of the Coen Tunnel in Amsterdam. For the completion of this project, it is noteworthy that the public sector shared the associated risks with the private sector. At the same time, during the execution of the project, there was proper time allocation and effective handling of legal issues (Rouboutsos, 2015).

In Greece, good practices of public-private partnerships are presented during the period between 2009-2019. These are partnerships through which projects have been completed, such as the integrated waste management system in some regions of Western Macedonia, Epirus, Ilia, as well as in the Peloponnese. Another successful partnership between the public and private sectors was the telematics and the implementation of electronic ticketing in the public transport system in Attica (Katsikis et al., 2013). Finally, it is noted that through PPPs, a total of twenty-four schools were successfully constructed in the regional unit of Attica, while seven fire stations were successfully constructed throughout the Greek territory (Belakova & Yurieva, 2020).

2.3. Digital Transformation and Growth through PPPs

Public-private partnerships are a matter of increasing importance, in the context of an ongoing effort to create and develop products and services. It is enough to consider that procurement spending in the public sector has exceeded the amount of two trillion euros on a European scale (Tolstolesova et al., 2021). In fact, on an international scale, the amounts of public procurement have even exceeded spending in favor of the research and development sector.

It is argued that through them it is possible to promote innovation, on top of the efforts made by countries to address a multitude of societal challenges. A typical example of such challenges is finding high level innovation solutions to address environmental issues (Siokas et al., 2022).

PPPs that promote and foster innovation take place when an organisation procures services and materials to serve specific functions or solve targeted needs within a specific timeframe. These are services and materials which are not available from the public sector at the time the partnership takes place in order to meet its needs. In this way, public-private partnerships lead to the development and provision of products and services of high levels of innovation through the development of new goods or the optimisation of existing ones (Liu et al.,

2020).

It is a type of policy whose implementation generates numerous benefits for both the private and public sectors, as well as for the whole of the existing social framework. Public-private partnerships help to accelerate the modernization of public administration, as well as to improve the quality levels of the public services offered (Galikhanov et al., 2020).

In addition, they can improve the competitiveness levels of a country's economic sector, while at the same time new business development opportunities based on innovative knowledge and know-how can emerge. Through partnerships, environmental and social challenges and problems are addressed and solved (Langford & Roy, 2006).

For the Greek state, partnerships do not play such an important role as a tool for services and products with high levels of innovation. There are few cases where they have been considered to contribute to the production process of highly innovative services and products, to optimise competitiveness or to enhance the outward-looking character. The cases of e-ticketing and the recycling factories can be considered as such (Dionysopoulou & Tsakopoulou, 2021).

A key feature of the partnerships between the Greek public and private sector is the lack of coordination. There is no common strategy to promote the developmental character of public procurement. An important problem concerns the low levels of trust of Greek citizens and Greek businesses towards the services offered by the Greek public sector (Siokas et al., 2022). The degree of application of functional, as opposed to technical specifications, at the planning stage of public procurement is also unsatisfactory. If this were done, then the levels of freedom offered by the power of supply, for the purposes of meeting the needs of public services, would be greater and would encourage the use of solutions of increased innovation (Charalabidis et al., 2020).

In the case of the Greek state, additional obstacle to the exploitation of high-level innovations in partnerships is the strong bureaucratic system. The bureaucratic nature of the Greek public administration is evidenced even by the long duration of tenders, which have ended up being extremely time-consuming procedures (Manos et al., 2014).

It is important to understand that the issue of digital transformation is inextricably linked to the transformation of digital culture and the reform of existing processes and specific business models already in use. From the perspective of the European Union, it is considered that one of the key pillars of the transition to digital transformation is the use of so-called "Digital Innovation Hubs" (DIHs). Through these hubs, it is possible to provide support to all active business entities on the issue of their digital transformation, as well as on issues of empowering and increasing innovation using digital technologies (Miörner et al., 2019).

In the digital transformation of the state, the ultimate goal is to develop specific models through which innovation in public administration can be enhanced.

These models will have the potential to develop and propose innovative solutions in the field of technology. Aiming at combining the knowledge already available and the continuous development of the existing scientific community with the expertise and experience of the private sector. In this process, the active participation of all citizens must be promoted in all cases (Crupi et al., 2020).

3. Research Methodology

The main methodological approaches followed are quantitative and qualitative research. Their aim is similar, but the approach shows differences. Their main difference is the process of data collection and analysis. The qualitative research approach examines the subject data under the subjective perception of the interviewees in the form of a perception study (Ritchie & Lewis, 2003). This type helps the researcher in a semi-structured discussion, which is driven by the interviewee's personal experiences on the research question. Quantitative research, on the other hand, collects numerical data through a broad sample of participants. A prerequisite for its formulation is the creation of structured questions (Kothari, 2004).

The approach of this study was formulated using a mixed method. Using both quantitative and qualitative methods, with interviews with a field of participants relevant to PPP-type projects and digital transformation. The questionnaire design was adapted from related research (Aben et al., 2021). Google Forms was used as the data collection tool.

The questionnaire design was based on a 7-point Likert scale. More specifically, variable 1 yielded full disagreement, while variable 7 yielded full agreement. The sections of the questionnaire were two. The first was concerned with the collection of demographic data, while the second was concerned with capturing personal evaluations on the issue under research.

The questionnaire was sent to the participants with a cover letter which aimed to describe the type of questionnaire, the purpose of the survey and finally sought for the participation of the participants. The process of sending the questionnaires was done in two ways, via email and via LinkedIn professional platform.

The sample consists of 85 executives of companies and public institutions. This selection was made on a relatively small range of employees and managers who have been involved in the process of implementing such projects. The response rate was at 68%, in an attempt to contact 125 participants, which is considered satisfactory and representative. In addition to the quantitative survey, the qualitative survey sought to reach 14 executives, with 11 ultimately responding and a corresponding response rate of 78.57%. The nature of the questions was such that they could not be answered by participants who were not knowledgeable on the subject matter.

The sample that participated in the research had experience in PPP projects, digital transformation projects, in the public and private sector. In Greece there

are specific PPP projects, so there are limited staffs that have been employed. A data base was made of the companies that have completed such projects, and respectively the public institutions where the projects were carried out. Then, the profiles of the candidate participants were searched through LinkedIn professional platform and based on their previous experience in the relevant projects.

In the context of the interviews, an attempt was made to select and collect information through semi-structured interviews. Due to the specificity of the topic, a specific scale has been chosen for the research. The survey refers to public and private sector executives who have been involved in PPP projects or in the transition to digital transformation. The aim of this research is to study, in addition, aspects that can contribute to the development of innovative proposals in various productive sectors and related services in the public sector.

The questionnaire is divided into two sections. The first section concerns demographic data. The second contains questions concerning the empirical approach from PPP project management, regarding the digital integration of the state. A seven-point Likert scale has been used, in terms of scaling of responses. More specifically, variable 1 indicates the lowest degree of acceptability, which progressively increases to 7, which is the highest.

The executives selected were mainly managers of large PPP projects. In addition, interviews were conducted with public sector executives responsible for the management of such projects and with legal experts who were authors of relevant contracts. Due to the circumstances imposed by the Covid-19 pandemic, the majority of the interviews were conducted through the MS Teams platform.

The interview approach was similar to that of quantitative research, where the aim was to answer the research questions. The notable difference with quantitative research was that it was open question. Particular emphasis was placed on the free will of the interviewees to express their opinions, always in the light of the subjective approach to the topic. An important factor that determined the response rate was the anonymity of the questionnaire, the specificity of the topic and the confidence given to the participant to cover the topic based on their empirical professional knowledge.

4. Results

4.1. Quantitative Research Results

The demographic results that follow are presented through descriptive statistics tables (**Tables 1-6**). In particular, frequencies, corresponding percentages and cumulative frequencies are presented.

The results show that the majority of the research sample, corresponding to 64 persons and 75.3%, is composed of men, while the remaining 21 persons, 24.7%, are women.

The results show diversity in the age categories to which the participants belong. This is a positive aspect of this survey since it involves that the views and beliefs of people of different ages have been collected. More specifically, most of

Table 1. Sex.

	Frequencies	Percentages	Cumulative frequencies
Men	64	75.3	75.3
Women	21	24.7	100.0
Total	85	100.0	

Table 2. Age.

	Frequencies	Percentages	Cumulative frequencies
25 - 30	5	5.9	5.9
31 - 40	32	37.6	43.5
41 - 50	34	40.0	83.5
51 - 60	7	8.2	91.8
>61	7	8.2	100.0
Total	85	100.0	

Table 3. Work sector.

	Frequencies	Percentages	Cumulative frequencies
Private employee	66	77.6	77.6
Public employee	19	22.4	100.0
Total	85	100.0	

Table 4. Work position.

	Frequencies	Percentages	Cumulative frequencies
Manager	32	37.6	37.6
Supervisor	25	29.4	67.1
Employee	28	32.9	100.0
Total	85	100.0	

Table 5. Business sector.

	Frequencies	Percentages	Cumulative frequencies
Industry	7	8.2	8.2
Construction	21	24.7	32.9
IT	27	31.8	64.7
Other services	30	35.3	100.0
Total	85	100.0	

the participants, 34 people (40%) ranged in age from 41 to 50 years old. Next, 32 people (37.6%) age range between 31 - 40 years old. Still, 7 persons (8.2%) ranged between 51 - 60 years of age. Similarly, 7 persons (8.2%) are above 61 years of

Table 6. Years of experience in PPP projects.

	Frequencies	Percentages	Cumulative frequencies
1 - 5	53	62.4	62.4
6 - 10	12	14.1	76.5
11 - 15	9	10.6	87.1
>16	11	12.9	100.0
Total	85	100.0	

age, while 5 persons (5.9%) age range between 25 - 30 years, falling in the lowest age category.

Regarding the sector of work, the majority of participants (66 people, 77.6%) work in the private sector and the remaining 19 people (22.4%) work in the public sector.

Regarding their job position, a total of 32 persons (37.6%) have a managerial position, 28 persons (32.9%) are ordinary employees and the remaining 25 persons (29.4%) are heads of departments.

The results show that 27 persons (31.8%) work in the technology sector, 21 persons (24.7%) work in construction, 7 persons (8.2%) work in industry and the remaining 30 persons (35.3%) work in other services.

Regarding their years of experience, the majority, 62.4% of the research sample, corresponding to 53 persons, stated that they have less than 5 years of experience. Continuing on, 12 individuals (14.1%) stated that they have between 6 - 10 years of experience, 9 individuals (10.6%) stated that they have between 11 - 15 years of experience and the remaining 11 individuals (12.9%) have more than 16 years of experience.

Table 7 presents the perceptions of the research sample on issues related to digitisation and PPP projects. It is clarified that participants were asked to rate each of the following statements on a scale ranging from 1 to 7. Results are presented in the form of means and standard deviations of their overall ratings per proposal. The statistics, presented in **Table 7**, refer to the mean values of the participants' responses and the standard deviations.

Regarding the mean values, the closer they are to 1, the higher the participants' disagreement with the respective proposal, while the closer they are to 7, the higher their agreement with the respective proposal. The standard deviation shows the range of dispersion of the participants' responses, i.e. how many points the participants' responses deviate from each other in order to form the corresponding mean value. **Table 7** shows the participants' beliefs, with the statements listed in descending order based on mean values.

From the above results, it can be seen that the participants declared an extremely high benefit to society as a whole from the digital transformation of the public sector ($M = 6.53$). It also shows that through the digitization of public service records, the flexibility and faster execution of important processes is promoted to an extremely high degree ($M = 6.31$). The elimination of time-consuming

Table 7. Beliefs and opinions.

	N	Mean values	Standard deviation
Society as a whole can benefit from the digital transformation of all public structures	85	6.5294	0.85340
Digital transformation and the integration of public services help to eliminate time-consuming procedures	85	6.3412	0.97043
The digitisation of records in tax offices, municipalities, NFCA will contribute to flexibility and faster execution of important procedures	85	6.3176	0.92854
The 4th industrial revolution must involve research in all structures, in order to create the right human resources	85	6.1412	1.08181
Digital transformation can contribute to the development of the national economy	85	6.1294	0.98547
Digital transformation reduces bureaucracy between public and private bodies	85	6.1176	1.07362
There is an urgent need to restructure the workforce to develop new services	85	5.9765	1.13365
Digitisation in the primary sector gives a competitive advantage	85	5.9647	0.93155
Financial transactions with the public sector will be largely automated	85	5.9176	0.99057
The development of PPP projects must deliver socially beneficial projects while providing fiscal incentives	85	5.8941	1.14459
Digitalisation in manufacturing can spur the development of innovative products	85	5.8824	0.90517
There will be a restructuring of human resources after the digital transformation is implemented	85	5.8000	1.08891
Digitisation of the primary production sector can help to ensure a better distribution of productive activity	85	5.6824	1.10423
PPP projects are an alternative financing tool for the implementation of innovative public services	85	5.6706	1.25725
The digital governance platform, https://www.gov.gr/ , has contributed to reducing the response times of Greek public services	85	5.5294	1.18108
The creation of smart factories puts Greece at a competitive advantage over the rest of Europe	85	5.4706	1.37657
New jobs will be created during the development of the digitisation project of public documents	85	5.3294	1.33085
Through PPP project partnerships, state industrial production can be developed through the development of smart factories with digital solutions	85	5.2941	1.47861
There are defects and failures that arise within the partnership framework	85	5.0706	0.96100
There are sufficient and qualified personnel for the development of digital innovations in Greece	85	5.0235	1.45550
During the development of a PPP project there are delays and problems in completing the construction phases	85	4.9529	1.32652
There is negative international experience of some failures and over-costing of PPP projects	85	4.8118	1.30470
The level of satisfaction with the level of digital services of public services is currently at low levels	85	4.7882	1.40657
The implementation of such projects will reduce the payroll costs of public organisations	85	4.6353	1.73100
Delays in the completion of construction phases are a burden on the public sector	85	4.4353	1.53101
The investment risk of a PPP project is largely borne by the private operator	85	4.3765	1.64734
There is a high level of know-how and a high level of cooperation of the public entity in the process of completing a PPP project	85	4.2706	1.40905
There are competent staff in the public sector to accompany the development and management of a PPP project involving digital transformation	85	4.1294	1.46213
Jobs related to digitisation are largely covered	85	4.0824	1.41600

Continued

After the contractor has completed the management of a digital transformation project, the public sector is capable of managing it afterwards	85	3.7647	1.41965
The level of satisfaction with the performance and services of employees in public sector organisations is currently at high levels	85	3.2000	1.40408

processes through digital transformation and integration of public services is also achieved to an extremely high degree ($M = 6.34$). The reduction of bureaucracy ($M = 6.12$) and the automation of transactions with the public sector ($M = 5.92$) are two additional consequences of the digital transformation of Greek public services. Furthermore, it was found that digital transformation can contribute to the growth of the national economy to a fairly large extent ($M = 6.13$).

However, in order to enable digital transformation, it is imperative to restructure the human resources of the public sector in order to develop new services ($M = 5.98$). The restructuring of human resources after the implementation of digital transformation is almost certain ($M = 5.80$), as is the creation of new jobs in the public sector ($M = 5.33$). However, jobs related to digitisation in the public sector are currently not sufficiently covered ($M = 4.08$), as well as there are low levels of satisfaction with the performance and services of civil servants ($M = 3.20$).

In addition, the digital transformation of the Greek public sector is at a relatively moderate level ($M = 4.78$). However, the digital government platform has contributed to the reduction of response times of Greek public services to a considerable extent ($M = 5.53$). A particularly important benefit resulting from the digitisation of the Greek public sector is the gaining of a competitive advantage in the primary sector ($M = 5.96$). In this way, innovative products are developed in the manufacturing industry ($M = 5.88$) and a better distribution of productive activity is achieved ($M = 5.68$).

More specifically, regarding PPPs, the results show that they are an alternative financing tool for the implementation of innovative public sector services ($M = 5.67$). However, it is a framework that is accompanied by several shortcomings and failures ($M = 5.07$), such as delays and problems in completing the construction phases ($M = 4.95$), which are also borne by the public sector ($M = 4.43$). The investment risk arising from a PPP project is also borne to a relatively large extent by the private sector ($M = 4.27$). The contribution of the public sector and its know-how in the implementation of PPP projects is considered to be quite helpful, since there are several competent public sector executives who accompany the development and management of PPP projects ($M = 4.13$).

However, the evaluation of the participants shows that this situation can be improved. One point that needs immediate optimisation is that once the contractor has completed the management of a digital transformation project, the public sector is not sufficiently capable of continuing to manage it ($M = 3.76$). The delivery of fiscal incentives and social benefits from projects carried out through PPPs are issues of urgency ($M = 5.96$).

Finally, it should be clarified that the participants agreed to a large extent that the fourth industrial revolution must involve university structures in research in order to produce suitable human resources for staffing public services ($M = 6.14$). On top of that, through PPP project partnerships, it is possible to develop state industrial production through smart factories, following the performance and supply of smart solutions ($M = 5.29$). At the same time, it is considered that the creation of smart factories can put Greece at a competitive advantage over other European countries ($M = 5.47$).

At this point, the results of the Cronbach's alpha reliability test of the 31 items included in the above table are presented. Acceptable levels of reliability are those where the reliability coefficient is above 0.7.

The results (**Table 8**) show very satisfactory levels of reliability. The reliability coefficient is in the range of 0.823.

Pearson correlation test follows to identify statistically significant correlations (sig. < 0.05) between the 31 items above and the demographic characteristics of the participants (**Table 9**).

Table 8. Reliability test.

Cronbach's alpha	No. of data
0.823	31

Table 9. Correlations between opinions and demographics.

	Sex	Age	Work sector	Work position	Business sector	Years of experience in PPP projects
Society as a whole can benefit from the digital transformation of all public structures	0.028	0.101	-0.069	-0.229*	-0.106	0.136
The level of satisfaction with the level of digital services in public services is currently at low level	-0.030	-0.107	0.041	-0.109	-0.132	-0.067
The digital governance platform, https://www.gov.gr/ , has contributed to reducing the response times of Greek public services	0.020	-0.029	-0.218*	-0.022	-0.066	0.181
Digital transformation and the integration of public services help to eliminate time-consuming procedures	0.024	0.002	0.015	-0.082	-0.004	-0.062
There will be a restructuring of human resources after the digital transformation is implemented	0.055	-0.080	-0.162	-0.140	-0.011	-0.084
The level of satisfaction with the performance and services of employees in public sector organisations is currently at high levels	0.074	0.053	0.186	0.088	0.018	0.026
There is an urgent need to restructure the workforce to develop new services	0.109	0.048	-0.064	-0.188	-0.099	0.187
Digital transformation reduces bureaucracy between public and private bodies	-0.114	0.061	-0.086	-0.099	0.030	-0.116
Financial transactions with the public sector will be largely automated	-0.063	-0.106	-0.185	0.010	0.020	-0.053
The digitisation of records in tax offices, municipalities, NFCA will contribute to flexibility and faster execution of important procedures	0.098	-0.238*	-0.215*	-0.026	0.021	-0.188

Continued

New jobs will be created during the development of the digitisation project of public documents	0.064	-0.055	0.037	-0.272*	-0.031	0.076
There is a high level of know-how and a high level of cooperation of the public entity in the process of completing a PPP project	0.084	0.014	0.239*	0.091	0.108	-0.047
There are competent staff in the public sector to accompany the development and management of a PPP project involving digital transformation	0.080	-0.060	0.205	0.082	0.241	-0.195
The implementation of such projects will reduce the payroll costs of public organisations	-0.069	-0.151	-0.149	-0.036	0.001	-0.088
There is negative international experience of some failures and over-costing of PPP projects	-0.085	-0.046	-0.075	0.035	0.189	0.041
PPP projects are an alternative financing tool for the implementation of innovative public services	0.042	0.135	-0.017	-0.127	0.003	0.223*
Digital transformation can contribute to the development of the national economy	-0.020	0.021	0.073	-0.236*	0.033	-0.002
Digitisation of the primary production sector can help to ensure a better distribution of productive activity	-0.033	-0.018	0.027	-0.221*	-0.062	0.049
Digitisation in the primary sector gives a competitive advantage	-0.037	0.042	-0.071	-0.214*	-0.121	0.003
Digitalisation in manufacturing can spur the development of innovative products	-0.168	0.047	0.070	-0.241*	-0.103	0.017
The investment risk of a PPP project is largely borne by the private operator	0.235	-0.067	-0.175	-0.090	-0.128	0.094
During the development of a PPP project there are delays and problems in completing the construction phases	0.145	0.100	-0.088	0.009	-0.067	0.263*
Delays in completing the construction phases are a burden on the public sector	-0.128	-0.062	0.125	0.034	-0.031	0.161
After the contractor has completed the management of a digital transformation project, the public sector is capable of managing it afterwards	-0.040	-0.118	0.250*	0.050	0.059	-0.101
There are defects and failures that arise within the partnership framework	0.129	-0.207	-0.158	-0.011	0.030	-0.141
The 4th industrial revolution must involve research in all structures, in order to create the right human resources	0.001	0.133	-0.070	-0.332*	-0.106	0.152
There are sufficient and qualified personnel for the development of digital innovations in Greece	-0.141	0.145	-0.165	-0.174	-0.067	0.086
Jobs related to digitisation are largely covered	-0.053	-0.028	-0.051	0.123	0.108	0.022
The development of PPP projects must deliver socially beneficial projects while providing fiscal incentives	0.245	-0.023	0.075	-0.190	-0.059	0.016
Through PPP project partnerships, state industrial production can be developed through the development of smart factories with digital solutions	0.108	-0.178	0.162	-0.075	-0.088	0.099
The creation of smart factories puts Greece at a competitive advantage over the rest of Europe	0.082	0.008	0.104	-0.206	-0.024	0.050

*Cases of statistically significant correlations (sig. < 0.05).

Statistically significant correlations are marked with (*). The statistically significant results show a negative correlation between the belief “The digitisation of records in tax offices, municipalities will contribute to the flexibility and faster execution of important procedures” and age, which means that this belief is held to a greater extent by younger participants and to a lesser extent by older participants. Regarding the work sector, two negative correlations emerged in the beliefs “The platform <https://www.gov.gr/>, has helped to reduce the response times of the Greek Public Services” and “The digitization of records in tax offices, municipalities will contribute to flexibility and faster execution of important procedures”, which means that both are more supported by private employees. Staying in the work domain, two positive correlations are additionally presented in the beliefs “There is high expertise and also synergy of the public entity in the process of completing a PPP project” and “After the contractor has completed the management of a digital transformation project, the public sector is capable of managing it afterwards”, which means that both are more strongly held by public employees.

The participants’ job position is the demographic characteristic that shows the most statistically significant correlations. More specifically, all statistically significant correlations are negative and relate to the beliefs “Society as a whole can benefit from the digital transformation of all public structures”, “New jobs will be created during the development of the digitisation project of public documents”, “Digital transformation can contribute to the development of the national economy”, “The digitisation of the primary production sector can contribute to a better distribution of productive activity”, “Digitisation in the primary sector gives a competitive advantage”, “Digitisation in the manufacturing sector can contribute to the development of innovative products” and “The 4th industrial revolution must involve university structures in research in order to generate suitable human resources”. The negative correlations demonstrate that the above beliefs are held to a greater extent by participants who work as managers or supervisors than by participants from other working position. Thus, these beliefs are more strongly supported by participants who hold positions of responsibility in the organisation in which they are employed.

Finally, regarding the years of experience in PPP projects, two positive and statistically significant correlations were found concerning the beliefs “PPP projects are an alternative financial tool for the implementation of innovative public services” and “During the development of a PPP project there are delays and problems in completing the construction phases”. This implies that these views are held to a greater extent by participants with more years of experience in PPP projects and therefore by those with more experience in this sector.

4.2. Qualitative Research Results

This section presents the results of qualitative research results. The results are presented through thematic analysis and the participants’ responses are listed by

research question.

Can the development of digital services and the development of the digital platform of gov.gr contribute to the joint service of citizens and businesses?

Participants were asked in what ways they believe that society as a whole can benefit from the digital transformation of all public structures, as well as the benefits that result from it, where according to their answers, the main benefits are in terms of time and money savings. An important result of digital transformation is the reduction of bureaucracy, simplification of procedures, saving of time and cost savings for human resources. Research indicates that reducing bureaucracy also pays off in financial benefits, with revenue for public coffers and the creation of conditions for new jobs in the public sector.

Through the digital transformation of public structures, the simplification and optimization of processes is promoted and achieved to a large extent, resulting in the reduction of bureaucracy, the better flow of information at all levels of public structures, helping in better decision-making at the higher levels of public administrations, the easy cross-referencing of data with other public services, the promotion and assurance of transparency. Digital transformation can prove to be beneficial to society as a whole as it leads to 1) saving time 2) reducing bureaucracy 3) transparency of processes 4) efficiency.

With regard to the fear of public employees of losing their jobs due to digital transformation, some indicative answers of the participants are highlighted. According to these responses, in the medium term, digital transformation will be an incentive for the public sector to rationalise its human resources and through this process a redistribution of human resources can be achieved through the formation and development of additional services. In the process of operation and transition to the new digital era new service areas can be covered by existing human resources.

Digital transformation also helps in understanding quantitative and qualitative KPIs of staff, improving performance, setting goals, highlighting some problems that could be solved, etc. Employees should and will develop skills that will serve the purpose of other services. In this way, it essentially results in freeing human resources from existing labyrinthine processes and using them in new innovative services that can be developed.

Evaluating the responses of the participants, it appears that only 2 out of a total of 11 participants confirm the fear of civil servants of losing their jobs. As for the remaining participants, they mentioned the enhancement of the skills of existing civil servants, but also the enrichment of their expertise and digital education and do not confirm the potential fear of losing their jobs due to digital transformation.

Participants asked about the time needed to sign PPP contracts all indicated either an unknown completion time or that it is a lengthy process that usually takes between two and three years, depending on the specific characteristics and diversity of the project. However, in other European countries the process does

not exceed 12 months, confirming the fact that in the Greek reality there is room for improvement through the digital transformation of the public sector.

Several failures and weaknesses of PPPs, which apply to the Greek reality, need to be improved. This is confirmed by the participants' responses, where they present the quality of writing such contracts as a key weakness. Many times, the understanding may be different by the parties involved, resulting in administrative and legal stumbling blocks during the start and during the implementation of the project. This results in delays in the completion of the construction phases.

The main failure of PPPs, particularly for services, is that technical specifications are designed after the project has been implemented. Those existing in the contractual framework are incomplete. Such changes can bring big delays. For example, a change in the project plans must go through an audit by the Court of Audit. There is also usually a lack of technical expertise on the part of the independent auditor, so that the availability of services is not effectively audited by anyone, considering the public body's inability to audit.

According to participants' responses, businesses are unable to participate in PPP projects due to the difficulty of finding financial instruments. Delays, legal actions for the appointment of the final contractor and legal obstacles during the implementation of the project are also considered to be key weaknesses.

Apart from the above weaknesses of PPPs, the benefits that they bring to businesses should not be overlooked. Typical are the responses of the participants, according to which private companies, in addition to their existing know-how, are given the opportunity to develop further know-how in innovative products and services through the course of completing the construction phases of the PPP. PPP projects also have the additional benefit of stable financial flows for many years in a relatively secure financial framework. This enables the development of the company's strategic planning and subsequent steps. It definitely advertises the company and gives it the opportunity to develop additional projects beyond the relevant PPP. Finally, the private entity due to both the financing framework and the control from the contractual framework does not have a very high financial risk.

Beside of the possibility of their participation in more projects that will be tendered in our country, great opportunities are created by the developments in the development of the institution internationally. Following these developments, one can see that the market for PPP projects is constantly growing. Apart from Great Britain, the country in which the institution was launched in the 90s and other Western Europe countries such as Portugal, Germany and Spain have been applying the PPP model for several years. Countries such as France, the Netherlands, Belgium and the Czech Republic have recently set up specialised units and where necessary, as in the case of France, have passed a specific law to speed up the promotion of PPPs. The development of the institution is characterised by the fact that the countries of Eastern Europe and the Balkans are also

taking similar steps. It is therefore easy to see that through their participation in the PPP projects being launched in our country, Greek companies will be able to accumulate the already considerable experience and reliability that they possess, the know-how that will make them competitive in the new market that is opening up.

What difficulties may arise during the completion stages of this process?

According to the responses of the participants, the digitalisation of public services has started, but further steps are needed to complete and implement horizontal forms of digitalisation in the public sector. The reason is that no funds have been invested through development programmes so far in this direction, European experience has not been used and there was certainly hesitation in making integrated policy decisions.

The operation of gov.gr has been positively evaluated in recent years, but in general the level of digital transformation is low and there is no appropriate infrastructure. Bureaucratic procedures still today overshadow any efforts of innovative services. Also, the framework of the ESIDIS platform, which is of interest to public tenders, is at a satisfactory level and is complete, transparent and seamless. In recent years, there has been a substantial improvement in various areas of Public Institutions due to the digital transformation that has started to be implemented in several institutions, resulting in simplification of procedures and quick processing (e.g. TAXISNET—tax offices, ERGANI at IKA-EFKA, gov.gr, “Diavgeia” of the Ministry of Infrastructure where all notices for Public Tenders are published electronically, etc.).

Considering the responses of the participants, the general picture is that the level of digital transformation of the Greek public sector is still low compared to other European countries. However, no one disputes the fact that remarkable efforts have been made, with a rapid pace of improvement. In fact, it was mentioned that the ground for further digital transformation of the Greek public sector is fertile and certainly amenable to further optimization.

Additional gaps also arise in the legal framework supporting PPP projects developed in Greece. Typical are the responses of the participants, where they state that the legal framework is not sufficient and improvements are definitely needed. The ministry should look at the positive and negative aspects of the legal framework and adapt them to the modern needs of project management. If necessary, help and support can be sought from consultancy firms where they have supported and implemented PPP projects in Europe.

According to the participants’ responses, Law 3389 comes to fill a legal gap, to solve a number of difficulties and problems and to facilitate the implementation of projects of social character. Unlike other pieces of legislation, Law 3389 does not exhaustively regulate all issues, nor does it apply uniform solutions to different projects and services. Instead, it encourages the elaboration of ad hoc solutions adapted to the specific needs of each project given its uniqueness and specificity. The legal framework needs to become more flexible for service de-

velopment related projects and needs further improvement and revision.

In the case of PPPs, useful suggestions and improvements were provided by the participants, such as to reformulate their legal framework and adapt it to today. Training is needed for the people involved in such projects. PPP projects need to be used by smaller actors, e.g. in public bodies such as local authorities that could through digital transformation projects help people in the culture of such projects. It would also be useful to appoint technical consultants in the public sector with experience in such projects to be able to address weaknesses in the implementation of PPP projects. To improve PPPs to bring maximum benefits, a review of legislation and flexibility on the part of the public sector is needed. The legal framework should give greater scope for private sector initiatives. Finally, a reduction of bureaucracy on the part of the public sector and greater consistency on the part of the private sector is needed.

Within the digital transformation process, are PPP-type contracts an alternative financing tool for the implementation of public services?

According to participants' responses, the financial framework is generally adequate. A well-designed project with regular financial flows can attract the corresponding funds. The benefits are stable funding, expansion of the scope of operations for each company, job creation, company advertising, and the development of innovations in technological areas. The benefits of implementing a PPP are a steady flow of funds as the project develops. The state proves that it is a reliable partner in the process of implementation and repayment of such projects and provides security for the private party.

The public investment program is flexible and favors large companies, where they have an ease of financing from other banks and equity by doing corporate finance of the project. The PPP-type implementation projects are a lucrative ground for investment development.

As regards the financing of PPP projects, most of it comes from the private sector, which uses own funds, foreign funds, guarantees and collateral and capital inflows resulting from the exploitation of the scope of the partnership. If the public sector decides to participate in the financing, it may come from the Public Investment Programme, the Development Law 3299/2004, Public Guarantees, the Community Support Framework and borrowing from the European Investment Bank. The State may also participate in the financing by contributing in kind through the granting of real estate for use, the granting of rights in rem in real estate and the granting of rights to exploit projects.

One of the reasons why Law 3389/2005 was passed is to address a number of issues that created problems in the financing and implementation of partnership projects in our country. These problems were identified during the implementation process of privately co-financed projects and were addressed through the ratification in parliament of specific regulations by a separate law applicable to each project. With the comprehensive treatment through Law 3389/2005 of issues such as, among others, the issuance of permits, archaeological findings, ex-

propriations, the procedure for the collection of the contractual consideration from the end users of the projects or services, the tax treatment of private entities that undertake the implementation of projects or services, the conditions are created for the successful and unhindered wider implementation of PPP projects in our country.

The involvement of banks in the projects contributes to the timely implementation of the projects as bank financing implies close control by the lending banks over the private entities that have undertaken the implementation of a PPP project. This control helps to keep costs low and to meet contractual deadlines. In addition, this control continues throughout the duration of the contract, thus ensuring that quality is maintained at levels acceptable to the public authorities. After all, the private contractor of the project must meet its contractual obligations because only then will it be paid by the public authorities and only then will it repay the bank loan.

However, regardless of the benefit that private companies derive from PPPs in terms of enhancing their stable cash flows, this does not mean that the PPP framework is entirely attractive to them. According to the replies of the participants, there are no fiscal incentives. The absence of attractive tax incentives for private companies involved in PPPs is a major weakness and may discourage them from participating in PPPs.

PPP contracts can be an alternative financing tool for both the public sector and businesses. However, this does not mean that companies do not take liquidity risks, especially when it comes to long-term projects. The reduction of liquidity risk and the delivery of further tax relief will make the wider PPP framework more attractive to private companies. This will also be of direct benefit to the public sector itself, since the main source of project financing is the private sector, which is of financial benefit to the public sector.

5. Conclusion

In both quantitative and qualitative analyses, the benefits to society at large from the digital transformation of the public sector are high. It brings flexibility and a reduction in the time needed to carry out important public service processes. It implies a better service for citizens and private companies dealing with the public sector. The reduction of bureaucracy and the automation of the speed of transactions within the public sector are two additional benefits of digital transformation, which were mentioned in both the qualitative and quantitative analyses.

However, an additional benefit of the digital transformation of the Greek public sector, which emerged from the quantitative but was not mentioned in the qualitative analysis, is the increased contribution to the growth of the national economy. From the qualitative and quantitative research, it is also evident that the current levels of digital transformation in the Greek public sector are moderate. At the moment, they are at the stage of noteworthy and respectable efforts,

but they need improvement. The digital governance platform is currently at a satisfactory level of operation and facilitation of stakeholders' transactions with the public sector, which was supported by both quantitative and qualitative research.

In the qualitative survey, the presence of fear of civil servants for the loss of their jobs with the completion of the digital transformation of the Greek public sector was reported. Both the qualitative and quantitative research revealed that a restructuring of public sector jobs would follow after the completion of the digital transformation. According to the qualitative analyses, the restructuring of public sector jobs does not necessarily imply a reduction in human resources. But it indicates the reassessment of its allocation to new jobs, following prior training and education. After all, the creation of new jobs is something that emerged from both qualitative and quantitative analyses. However, one fact that emerged from the quantitative analysis is that the jobs that are inherent to digitisation are not sufficiently covered in the public sector. This is an issue that can be addressed through the education and training of existing civil servants.

With regard to the specific context of projects implemented through PPPs, both the qualitative and quantitative analyses revealed the presence of gaps and deficiencies that need to be optimised. The presence of delays in the execution of projects was revealed. While in Europe, the overall process does not exceed one year, in the case of Greece, the time required from the moment a project is posted and the signing of the contract can take between two or three years, depending on the particularities and characteristics of the project in question. The inadequate evaluation and monitoring scope, as well as the unclear wording of contracts due to the lack of a specific standard, are additional black spots that need improvement in the PPP context.

The problem of the bureaucratic procedures followed in the Greek public sector seems to have a big impact on the PPP framework. This is a major obstacle that needs to be overcome, as it not only undermines the quality of the PPP process, but also delays the successful digital transformation of the Greek public sector.

However, both the public and private sectors benefit from their involvement in PPP projects. Both quantitative and qualitative analyses have shown that PPP projects can provide a stable financial flow. The qualitative analysis has shown that big benefits can be obtained by private companies, at a time when repayments from the public sector may be delayed but are always made. At this point, the problem that the private sector has to face is one of liquidity.

Additional benefits that private enterprises derive from their participation in PPP projects include promotion and advertising issues, as well as issues of strengthening their outward-looking character. This means that private companies, through their participation in PPP projects, can further develop their innovation levels, become more competitive and expand their investment opportunities on the international market. In any case, however, sufficient risk compensation is required before a private company decides to participate in a PPP project.

It is a fact that long-term PPP projects are currently undertaken by large companies that are able to cover any future liquidity problems that may arise. For this reason, it is proposed to include short-term projects in the PPP framework, so that smaller private companies can also participate in them. This will allow even smaller business units to reap the benefits of participating in such projects.

The need for tax incentives from the participation of firms in PPP projects is an issue that emerged from both qualitative and quantitative analyses. The addition of additional tax incentives to private firms, combined with a reduction in the long-term duration of PPP projects, would help to encourage more and more firms to participate in PPP projects.

Finally, it is noted that through PPPs, it is possible to develop state-owned industrial production. Through the development of smart factories and then the performance and supply of smart solutions, Greece can gain a significant competitive advantage over other European countries. However, the digital transformation of the Greek public sector needs to be optimised. This study argues that by improving digital transformation, Greece will be led more smoothly into the conditions shaped by the fourth industrial revolution. The point in which the fourth industrial revolution can positively contribute to digital transformation is that it can involve university structures in research. In this way, it can help with education and training issues in the public sector, in order to raise the level of digital education.

A limitation of this research is the research sample of 85 people, but the sample does not include generally employed persons in the private and public sectors. It includes employees that have been involved in the implementation of PPP projects. This gap was filled through a combined qualitative analysis of the results through conducted interviews. It is proposed to conduct a similar survey, in which a larger and more representative research sample will participate. Thus, the results of this survey will make it possible to generalise the views and beliefs of the participants for the whole of the Greek territory.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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