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**Creation and dissemination of material and services for the
Digital Governance Research Center**

DIPLOMA THESIS

by

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To my family...

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Acronyms

ICT	Information and Communication Technologies
CoE	Centre of Excellence
HER	Higher Education and Research
DGRL	Digital Government Reference Library
IoT	Internet of Things
OECD	Organisation for Economic Co-operation and Development
DGRC	Digital Governance Research Centre

Περίληψη

Η παρούσα Διπλωματική Εργασία αφορά τη δημιουργία ενός κέντρου αριστείας για τη Ψηφιακή Διακυβέρνηση, υπό το πρίσμα των υπηρεσιών που πρέπει να δημιουργηθούν και να διαδοθούν. Ξεκινώντας από τις κατευθυντήριες που η σχετική βιβλιογραφία παρέχει για περιπτώσεις κέντρων αριστείας σε ανάλογες θεματικές περιοχές, η Εργασία θέτει τη βάση για τις ανάγκες ενός τέτοιου κέντρου. Στη συνέχεια, προσφέρει μια ανάλυση πεδίου για τις υπάρχουσες υπηρεσίες που παρέχονται από παρόμοια κέντρα στον τομέα της Ψηφιακής Διακυβέρνησης και παρεμφερών τομέων. Παρουσιάζει τις δέκα πιο σχετικές και εφαρμόσιμες υπηρεσίες για ένα τέτοιου είδους κέντρο και τις περιγραφές τους. Στη συνέχεια, εκθέτει τις προδιαγραφές για τις τρεις πιο σχετικές από αυτές, παρέχοντας εκτενείς πληροφορίες που μπορούν να αξιοποιηθούν στη διαδικασία υλοποίησης των υπηρεσιών. Έπειτα, προβάλλει την υλοποίηση της μίας πιο εξέχουσας, η οποία περιλαμβάνει τη δημιουργία ενός πρότυπου διαδικτυακού εκπαιδευτικού προγράμματος πάνω στην Ψηφιακή Διακυβέρνηση και στον Ψηφιακό Μετασχηματισμό. Τέλος, φανερώνει τα συμπεράσματα που προκύπτουν από τα προηγούμενα βήματα και συζητά τρόπους που μπορούν να αξιοποιηθούν, από την ερευνητική και όχι μόνο κοινότητα, ώστε να δομηθεί ένα κέντρο αριστείας που περιλαμβάνει τη συνεργασία πολλών μελών που εκπροσωπούν διάφορες πτυχές του δημόσιου οικοσυστήματος, όπως πανεπιστήμια, επιχειρήσεις, δημόσιους φορείς, μη κυβερνητικές οργανώσεις καθώς και νέες και νέους ερευνητές και μαθητές.

Λέξεις Κλειδιά: ψηφιακή διακυβέρνηση, ψηφιακός μετασχηματισμός, κέντρο αριστείας

Abstract

This Thesis concerns the creation of a center of excellence for Digital Governance, in the light of the services that need to be created and disseminated. Starting from the guidelines provided by the relevant literature for case studies of centers of excellence in similar thematic areas, the Thesis lays the foundation for the needs of such a center. Then, it offers a field analysis of existing services provided by similar centers in the field of Digital Governance and similar areas. It presents the ten most relevant and applicable services for such a center and their descriptions. Afterwards, it sets out the specifications for the three most relevant of these, providing comprehensive information that can be used during the service implementation process. Subsequently, it provides the implementation of the most prominent one, which includes the creation of a prototype of an online training course on Digital Governance and Digital Transformation. Finally, it displays the conclusions from the previous steps and discusses ways that they can be used by the research community and not only, in order to build a center of excellence that includes the collaboration of many members representing various aspects of the public ecosystem, such as universities, businesses, public bodies, non-governmental organizations as well as young researchers and students.

Keywords: *digital governance, digital government, digital transformation, center of excellence, centre of excellence*

1

Introduction

1.1 Context and Necessity of Diploma Thesis

The current economic, societal and political status quo is deeply affected by several concepts, with one of the most prominent of them being digitalization, a term which is not newly emerged in literature, since it started nearly sixty years ago with the computer revolution (Frach, Fehrmann & Pfannes, 2016). Today, the utilization of the ICT in different sectors is one of the main drivers of digitalization. One of the most prominent combinations is the one of ICT and public administration. This combination is a subject that has been widely addressed in the last twenty years' literature, along with the change that will be brought by the inclusion of ICT in public administration and governance (Fountain, 2003).

Digital governance is a research domain that aims to increase efficiency and effectiveness of the of the public sector and its services provided both internally and externally, utilizing the ICT solutions (Charalabidis & Lachana, 2020). This research domain is inseparably connected with the digitalization and its study could be of significant importance, especially considering the recent directions related to cocreation between digital government and public administration research domains, underlining their common characteristics, theories and methods (Gil-Garcia, Dawes & Pardo, 2017).

One widely adopted action towards advancing a scientific field's education and research capacity is the creation of a research center, and more specifically a Centre of Excellence (CoE). Literature suggests that CoEs can serve the Higher Education and Research (HER) goals in terms of capacity building, scientific interdisciplinarity and cooperation and research outputs (Hellström, 2018; Borlaug & Langfeldt, 2019; Hellström, Brattström & Jabrane, 2018). And while literature

indicates the need for capacity building (Pappel et al., 2017; Sarantis et al., 2019) and further research (Wirtz & Daiser, 2016) and development (Chen, 2021) in this thematic context, the existence of research initiatives that analyze the fundamental aspects and services provided by a CoE for digital governance are scarce. That is disadvantageous for the relevant scholarly discipline, since the CoEs emerging in this area could assist the education, research and practice and a formal examination of their needs and structure could lead to an increase in the quality, effectiveness and dissemination of their research outputs. The necessity for structured analysis of a CoE's characteristics is intensified by the current international orientation of the research in this kind of organizations (Klerkx & Guimón, 2017; Zacharewicz, Sanz Menendez, Jonkers, 2017; Pfothenauer et al., 2016). This adds to the complexity, especially for the scientific fields like digital governance, which is directing towards an international provision of services, especially in the European Union, thereby demanding more research due to the potential challenges emerging (Williams, Falch & Tadayoni, 2018).

1.2 Aims of the Diploma Thesis - To whom it is addressed

This Diploma Thesis aims to provide the analysis of the fundamental characteristics of an exemplar CoE for digital governance education, research and development. Starting with examining the current status quo of both the scientific domain of digital governance and the directions of the CoEs, the Thesis identifies the basic aspects that should be considered before organizing, designing, implementing and maintaining the CoE and their services. Later, it analyzes the existing solutions provided by the CoEs and the research centers and relevant institutions in general. With this analysis conducted, the next step includes the description of the most prominent of those services and solutions. Based on these descriptions, the most prominent of these services is being provided, bringing both its structure and its design and content creation. Finally, the results of this Thesis are being discussed in order to extract useful insights on the status quo of the digital governance research institutions and the directions towards organizing a relevant CoE.

This study can be beneficial for academic institutions, research laboratories, Universities, public and private organizations that aim to form a research center, or more specifically a CoE focusing on scientific aspects related to digital governance. It can assist them in their effort to organize the selection of their services provided, in order to bring the best-suited solutions and results depending on their target group and their objectives. Additionally, it can help them to understand the domain's needs, so that they can diversify their endeavor from the rest. Finally, by providing an overview of the main research directions of the CoEs, this study provides both the evolution of the scientific field of digital governance as well as indications for its future.

On the same level, the individual researchers, students and practitioners can benefit from this study, since they can examine the research aspects that might concern the future scholarly community of the digital governance and its related scientific fields. They might even expand the analysis provided in this study in order to combine the knowledge base of the digital governance with the ones provided by other scientific domains. However, it is not only the exclusively scientific communities that might be interested in this study. Entrepreneurs and innovators might also be

interested in studying the results that are hereby presented, since those can be the basis of the future innovative endeavors of the digital public sphere.

1.3 Subject and Limits of the Diploma Thesis

Since the aim of this Diploma Thesis is to provide the fundamental services of a CoE focusing on digital governance, a large portion of its content is the services analysis. The analysis is conducted on different levels, moving from more concise to more thorough depending on the inclusion's necessity. The instruments used in order to identify, cluster, examine and formally generate the services can be tables, descriptions, slides and other forms of information provision. The generic information is provided in more quantitative schemas, such as tables, while the more pivotal for the services information is provided in more analytical schemas, such as descriptions.

The precise structure of the information provided by this Thesis follows the aforementioned principle and is presented as follows: the current services and solution provided by the relevant research centers and CoEs is presented in table form, the selected solutions that match the criteria to be included to the exemplary CoE proposed are presented in a more deep but formal description and the one selected to be implemented is presented in its initial form, in its full extent.

It is important to clarify that this Diploma Thesis does not focus on the development of the digital means that will accompany the creation of the whole CoE. In other words, this Thesis does not include the actual digital channels (website, CMS, multimedia players, social media etc.) on which the CoE will rest its functions and its services. This Thesis focuses on the organization, design, research foundation and content creation of some of the fundamental services provided by such a center. Consequently, the actual development of the CoE can be completed in future research studies.

One other important note, is that it is not perceived as necessary that the selected services of the CoE should be included in another digital governance research center. Some newly emerged and innovative services could potentially be part of this endeavor, since they might not be included in a previously developed center, due to the fact that the thematic scope of that center differs. Since digital governance is a multidisciplinary scientific field, there are examples of services that do not fall under this exact field, but could be advantageous towards its evolution, because of they provide advancements in the fields of education, training, funding, innovation etc. Consequently, the inclusion of the services is not strictly limited to the already established ones or the ones that necessarily fall under the digital governance scientific field, but it depends on their value towards enhancing the capabilities of the CoE and their contribution for a more complete HER endeavor.

1.4 Structure of the Diploma Thesis

The Diploma Thesis is structured as follows: Chapter 2 provides the scientific field analysis and the current situation in the research and development concerning both the digital governance and the CoEs, Chapter 3 presents the methodology that has been followed in order to conduct this study, Chapter 4 includes the results of this Thesis categorized, Chapter 5 gives the discussion over the

results and Chapter 6 concludes the Thesis. The last Chapter includes the references used in this Thesis.

2

Scientific Field Analysis - Current Situation

2.1 Fundamental Concepts - Definitions

Before examining the services and the structure of the information provided by a digital governance CoE it is important to understand the specific scientific field's particularities and trends. The first step of this understanding is to state the definitions and the fundamental concepts of both the notion of the CoE and its specific thematic area, in this case digital governance.

This section includes the analysis of the definitions for both the digital governance and the fundamental concepts of a CoE. The first part of the analysis explains the scientific scope of digital governance, its evolution, its related scientific fields and its scholarly community. The second part analyzes the basic characteristics of a CoE, the most common CoE types and their contribution to HER.

2.1.1 Digital Governance

Digital government (or e-government as the term was initially introduced) aims at the inclusion of ICT in government organizations with the goal of increasing efficiency, interoperability, service improvement and citizen centricity (Pereira et al., 2018b). Even if this term seems similar to the one of digital governance, those two are not interchangeable. Digital governance aims at a wider increase in the efficiency of the public sector, resulted from the adoption of ICT solutions, while digital government focuses specifically on delivering better services to the citizens with the usage of ICT (Fang, 2002). The difference is discussed among other similar literature studies, where government is considered the structure of the relevant topics while governance is mostly related to the set of processes, capabilities and the underlying purpose of the relevant topics (Bryant, 2018).

In order to have a coherent explanation of the relevance of the previously mentioned terms in the current research state, it is important to observe their evolution as it is recorded by literature. The first generation of digital government, following the Government 1.0 literature term, mainly focused in optimizing processes and increasing efficiency in the existing public services (Janowski, 2015). The second generation of digital government, Government 2.0, moved forward from establishing digital means for implementing procedures and increasing efficiency of the public

sector, to the extension of the citizens' involvement in the public decision-making process, with research terms like e-participation, transparency and accountability gaining significant attention from the scientific communities (Chun, 2010). One of the most prominent terms in the current literature is the one of the third generation of the digital government, namely of Government 3.0. Pereira et al. (2018a) defined Government 3.0 as *“the use of disruptive ICTs (blockchain, big data and artificial intelligence technologies) in combination with established ICTs (distributed technologies for data storage and service delivery) and the wisdom of crowd (crowd-sourcing and co-creation) towards data-driven and evidence-based decision and policy making.”*. Generally, Government 3.0 combines the capabilities of the two previous generations, with the additional influence of some emerging technologies, in order to provide better decision support and assist policy making (Lachana et al., 2018). One of the most prominent examples of administrations that focused on the transition to a Government 3.0 model is the one of South Korea. Park administration (2013-2017) put digital governance in the epicenter of their administration, with the government planned to be service-oriented, transparent and competent and the core values of this strategy being openness, sharing, communication, and collaboration (Nam, 2017).

While the different generations of digital government differ in certain levels of analysis, it is important to study them based on common criteria, in order to track the evolution and the points of interest in each generation. Charalabidis et al. (2019) provided a classification of the fundamental points of the comparison of the generations. The main aspects that were examined were the main goal, the main method, the usual application level, the key tool, the key obstacles or risks, the key ICT area and the most needed discipline beyond ICT. The results of the analysis were based on the relevant literature studies that focus on each aspect. The different digital government generations differ in most aspects of analysis. For instance, the main goal of each generation is recorded to be Better Services, Openness and Collaboration and, lastly, Societal problem-solving, citizen well-being and optimization of resources for the Government 1.0, 2.0 and 3.0 respectively, or Key ICT Area in each generation is recorded to be the Organizational Infrastructures, Social Media and Open and Big Data and, lastly, Artificial Intelligence and Internet of Things for the three generations respectively. However, there is one aspect of analysis concerning the three generations where all three of them seem to face similar Key Obstacles and Risks, that fall under the same category: Public Sector Mentality, with numerous literature studies supporting that.

Literature indicates that there is space for further categorization of each generation advancements, thus creating sub-generations of digital government. Layne and Lee (2001) suggest four stages of e-government growth, which can be interpreted as sub-generations, specifically concerning Government 1.0 generation. These stages are the following: the catalogue stage, where the information is provided by the public organizations through the web in static form, the transaction stage, where the transaction facility is offered, the vertical integration stage, where the interconnectivity of the systems in the same thematic or local level is the main objective and, lastly, the horizontal integration stage, where the interconnectivity of the systems across thematic domains or regional levels is aimed. Based on the previously presented model of analysis of the growth that could lead to the sub-generations, several studies and reviews provide elaborations and expansions of the initial model, with several studies analyzing these models (Debri & Bannister, 2015; Almuftah, Weerakkody, & Sivarajah, 2016). One of them (Scholta et al., 2019) states that some of

the models emerged provide an additional stage that is related to Government 2.0, including e-democracy and e-participation services.

The relevant literature studies concerning the stages and the sub-generations of the second generation, namely the Government 2.0, follow a different approach. Some of the models proposed focus on the purpose of the usage of social media in the context of the citizen participation, which is integral for the digital governance in the second generation (Lee & Kwak, 2012), while others focus mainly on the technical aspects of the usage of social media (Androutsopoulou, Charalabidis & Loukis, 2018). Generally, the stages of the maturity model of this generation, as stated by Lee & Kwak (2012), are: the initial conditions stage, the data transparency stage, the open participation stage, the open collaboration stage and the ubiquitous engagement stage. Each of these stages represents a gradual increase of the usage and of the influence of social media. The sub-generations for Government 3.0 faces limited analysis in the literature, while there are already studies for the next generation, namely Government 4.0 (Sagarik, 2018; de Marcellis-Warin & Warin, 2020).

Literature suggests that the demand for relevant applications is increasing, especially for applications that combine different domains and professions (Ogonek et al., 2016). That is also visible through the existing funding opportunities, with European Union's "Horizon 2020" program alone providing approximately 80 billion euros between 2014 and 2020 (Charalabidis & Lachana, 2020).

In the meantime, the relevant academic work is also significant. In the last 20 years, the number of the conferences and the published papers related to digital governance and digital transformation have significantly increased, with the generated knowledge base being more than 5500 peer-reviewed publications, not counting non-English-language publications (Scholl & Dwivedi, 2014). The average of the peer-reviewed publications, based on the multi-year comparison, exceeds the number of 400 publications and it mostly includes conference and journal publications, with the addition of some book chapters and other forms of publications (Scholl & Dwivedi, 2014). The academic work's increase can be also monitored through the Digital Government Reference Library (DGRL), which includes at least 15,731 references, mostly English-language and peer-reviewed, of this particular scientific domain (DGRL, 2021).

It is apparent that digital governance is a prominent field of study for both academics and practitioners of several disciplines. While the fact that is multidisciplinary field of study provides unique opportunities for collaboration and innovation, it poses certain challenges. Consequently, the education, research and development of this particular field should be organized in a sophisticated manner.

2.1.2 Centre of Excellence

The definition of a CoE is not consistent. It depends on the context of examination, and it has also evolved over time. Hellström (2018) defines CoEs as "*organizational environments that strive for, and succeed in, developing high standards of conduct in a field of research, innovation, or learning*". CoEs may consist of specialized experts (Appirio Hub, 2017) or organizational environments or entities (SEEDS Technical Services & Knowledge Links, 2014). Of course, since the direction is not consistent, the definition may change depending on the type of the organization

that hosts it. For instance, Gartner (2016) defines a CoE as “*a physical or virtual center of knowledge concentrating existing expertise and resources in a discipline or capability to attain and sustain world-class performance and value*”. NATO (2020) defines CoEs as “*international military organisations that train and educate leaders and specialists from NATO member and partner countries*”. There are several definitions of a CoE and as it is visible through the previous examples, the thematic context changes the direction, with aspects like research and training being commonly referred in the previous definitions.

Fekadu et al., (2021) elaborate on the perception of the scientific community concerning the notion of excellence, stating that this notion has faced criticism on occasions, particularly on account of its lack of apparent definition. Additionally, analyzing the term’s etymology, they come up with the implication that excellence refers to prominence as well as movement and evolution.

The roles and the responsibilities of a CoE also depend on its context of application. For instance, a typical CoE funded by the European Commission, namely an Erasmus+ Jean Monnet Centre of Excellence, has the responsibility of organizing and coordinating resources, leading research activities, collecting, analyzing and publishing the relevant results (Erasmus+ - European Commission, 2021). In contrast with the academic CoEs, Gartner (2016) states that a corporate oriented CoE may focus on aspects like analytics, digital commerce, and generally drive not the business-as-usual culture but the excellence in a medium through leveraging knowledge. It is apparent, that the goals and the organization that hosts the CoE influences its actions, with the academic type mainly focusing on HER aspects while the corporate type mainly focusing on increasing efficiency in the respective business domain.

As it is previously mentioned, there are various types of CoEs and they range also in terms of their funding mechanism. The academic CoEs, meaning the ones that are typically hosted by a university or a HER institute, can find various financial sources, for instance national research programs, national funding foundations or international programs, like the previously mentioned European Commission’s Erasmus+ programme.

Borlaug (2016) identifies the basic agencies and their relations concerning a CoE and their funding institutions. Those agencies are the following: the Government, which regulates the work of the funding agencies, the funding agencies, that organizes the funding mechanism and provides the grants to the CoEs while monitoring their results, the CoEs, which are responsible to provide the grants to the individual researchers and their partners and monitor the research, the researchers, which actually implement the research process and finally the host organization, i.e., a university or a research institute, that may provide additional infrastructure and support to the CoE.

One particular relation aspect that is apparently connecting almost every agent in the previously mentioned scheme is the resource allocation and the funding grant. The funding and the availability of resources for existing or future research is considered an indicator of healthy epistemic capacity in such research institutions (Hellström, 2012). The same principle applies for the third-party funding too, which is considered an important part of the existence of a CoE (OECD, 2014). There are recorded cases of funding agencies are observed to shift their funding examination criteria from solely the high-level research to examining the added value and the application of the results in the social context (Luukkonen, 2014).

Another significant aspect that is relevant with the CoEs' role in research and education is the one of capacity building. Shams (2016) defines capacity building as *"a continuous process to develop innovative capacities in socio-economic settings through on-going development and adaptation of strategies and processes that enable higher advantage in collective and individual levels, compared to the prior strategies and processes to enhance socio-economic development"*. Hellström (2018) argues that CoEs can assist capacity building, since they can optimize human resource development, enhance organizational capacity and empower the HER activities with the right framework that affects innovation and socioeconomic development. And taking into consideration the evolution of capacity building in some prominent scientific domains, like sustainability, the education process may need to be shifted towards a more relevant direction (O'Rafferty, Curtis & O'Connor, 2014).

CoEs can add value to the research initiatives' actions in other ways too. Wigren-Kristoferson, Gabrielsson and Kitagawa (2011) argue that CoEs are seemed to assist the dissemination of the research output of the projects, since they are perceived as collective responsibilities by the CoE members. Additionally, they mentioned the creation of a number of spin-off companies, which started from the CoE research environment and acted as a connection point between the research institutions and the market (Wigren-Kristoferson, Gabrielsson & Kitagawa, 2011).

However, the role of CoEs in the HER domain is not exclusively positive. There are recorded challenges and drawbacks in the institutionalization of the CoEs in the academic environment. One significant danger is the creation of divisions inside the academic institutions and the creation of a culture of unhealthy competition for financial resources amongst the research units (OECD, 2014). Another danger lies to the notion of "excellence" itself. Since the notion of excellence, varying amongst the teaching and the research aspects, can be identified by external funding programmes' criteria, the host organization, namely the university implementing a CoE, might be found in a situation where the external involvement can disturb the balance between the existing governance and academic culture and the culture of pursuing excellence (Aarrevaara, Wikström & Maassen, 2017). Furthermore, leading an academic institution focusing on excellence requires top-down management, with the executive administration managing the university strategic plans, decreasing the level of autonomy for the academic professionals, thereby making it less desirable work environment, while simultaneously not having the success of the outcomes guaranteed, since the administration does not possess significant control over the academic aspects of the university function (Maassen, 2017).

One of the main aspects that poses challenges in the function of CoEs in the academic ecosystem is related to the funding mechanisms of such initiatives. Borlaug (2016) argues that the two fundamental dangers emerged during the funding process are the moral hazard, meaning the unacceptable actions of the CoEs against the agreement with the funding agencies, and the adverse selection of funding, meaning it is difficult for the funding agency to possess the expertise to evaluate the applicants and select the right CoE. The set of the existing solutions for these problems, include generation of evaluation indicators for measuring the results, positive or negative sanctions, peer-review process with experts of each field and other measures (Borlaug, 2016).

Overall, the role of CoEs is advantageous for the academic community, with the scientific results generated being in the frontline of the research and development in a lot of domains. The

different types of CoEs can also benefit their host organization, either that being an enterprise, an international alliance or another type of institution. CoEs act as enablers for HER activities and can assist in various aspects, for instance capacity building, research innovation, dissemination and entrepreneurship. However, the existence of challenges makes the careful organization, funding and research conducted related to the CoE imperative, in compliance with the ecosystem that it will be implemented to.

2.2 Current Situation

The current situation in the research and development is deeply influenced by the COVID-19 pandemic. The relevant metrics indicate that the usage of digital technologies as well as the data utilization has positive impact in handling the crisis, especially embracing innovative initiatives (OPSI – OECD, 2020; 2021). Aside from the innovation in terms of embracing digital technologies, openness and collaboration are also significant points of the agenda related to the handling of the crisis (OECD, 2020c).

Current research and implementation directions can be manifested in the six essential characteristics of the digital government, namely the OECD Digital Government Policy Framework (OECD, 2020c). Those six characteristics are: 1) Digital by design, digitalizing and modernizing the service delivery, 2) Data-driven public sector, generating public value using data in the different stages of public policies, 3) Government as a platform, with government acting as a platform with digital tools, software and data, 4) Open by default, with data and processes being available to the public, 5) User-driven, where people have a more active role in shaping processes and policies and 6) Proactiveness, where public organizations are prepared for the needs for the citizens and respond more efficiently (OECD, 2020a; 2020c).

Recent research endeavors aim to encompass the aforementioned characteristics to the active organizations, in order for the latter to achieve a more digitally-enabled work environment and services delivered. One significant part of the relevant research endeavors is the aspect of digital competencies and training capacity, as it is mentioned in several studies (Vasilieva, Pulyaeva & Yudina, 2018; Casalino et al., 2020; Oborin, 2021). More specifically, Casalino et al. (2020) identified 18 learning topics that could lead the future of digitalization of public organizations, with disruptive technologies enabling, digital transformation and big data management being among them.

With the current research and educational directions identified it is necessary to keep them in mind when designing, implementing and disseminating the services of a relevant CoE, or a research center in general. Additionally, the form of presenting the information inside the services should be inclusive, since there is need for the involvement of not just the stakeholders and the experts but also of the citizens, the industry and the public officials.

2.3 Conclusions on the Current Situation (and Research Needs)

The previous analysis of the relevant literature in the two aforementioned scopes revealed the status quo of the education, research and development that could direct the service design and

implementation of a CoE in the subject of digital governance. However, even with the literature analysis conducted, it is not apparent which services are necessary and the exact form of presenting them in order to increase the effectiveness of the CoE. In other words, there is still space for specifying the needs that such a CoE would cover both in academic and non-academic terms.

The needs that should be covered by a paragon of digital governance CoE are largely mentioned in the literature analysis. Contribution to the openness ecosystem both in terms of data and processes, training for public officials and relevant stakeholders, tools hosting and development as well as innovation and co-creation of services are only few of the examples that are met in the bibliography. However, even if the status quo of the academia reveals some of the fundamental services that a CoE should include, there are still some aspects of the service provision that should be specified. One of them is the form of the services.

There is a plethora of active CoEs that pertain to the digital governance scientific domain. They vary in terms of both their services and their target group. Studying the most prominent of them can be proven of significant value, since it could help in the specification of the form of the services. That is due to the fact that, for a service, the most widely implemented form of provision is the most reliable and it might imply that the users are familiar with that specific form in a greater extent.

The service specification itself is advantageous not only in the context of formulating the way of providing the service to the users of the CoE, but also of deciding which services are more appropriate to be included in the CoE. As previously stated, there is a plethora of active CoEs, with varying services and target groups, so including all the possible services in the current CoE is not an advisable direction. That is due to several reasons, namely the feasibility of hosting and maintaining the digital services, the user experience that could be jeopardized by the complexity emerged but also the diversity of the ecosystem at which the CoE will be implemented and its target group. In other words, there is significant need for prioritization of the services that should be implemented in a prototype digital governance CoE, that is based on the services specifications.

After the service specification identifies the most prominent services there is still need for planning the interaction of the services and the CoE with the users and the feasibility of the CoE itself. The feasibility does not refer on the financial aspect alone, but also the co-creation of new, innovative services for the CoE, the feedback for improvement and the inclusion of more new members so that the CoE will expand its capabilities and its scope.

The next chapters of this Thesis provide the solution to these needs. Starting with the methodology on which the research is based, the Thesis establishes the work plan. Afterwards, the Thesis provides the current CoEs' services analysis, the proposed model for specifying the services, the exact services that are being provided as well as a plan for the feasibility of the specific digital governance CoE.

3

Methodology

3.1 Methodological Steps

This chapter includes the steps that were followed in order to specify the services provided by the CoE. Each chapter corresponds to a level of the process of defining the services and their management. In addition, the chapter provides the exact outcome of each step in order to provide an overview of the final structure.

3.1.1 Field Analysis

The first section of the study is the analysis of the existing CoEs. Specifically, there is a certain need for identifying the services that they are currently provided by them in order to define the strengths and weaknesses of the research, development, education and networking of the digital governance.

This is the foundation of the actual description and development of the services of the CoE, since the services of the proposed CoE should be aligned with the currently functioning ones. However, that does not imply that the proposed services will be identical with the existing ones. Firstly, the CoE should follow the needs and particularities of the Greek ecosystem. Secondly, there is still need for innovation and expansion of the current service sets, even if the examination scope is on the international level.

The CoEs and their services provided should not be homogenous. It is logical that some services to appear more regularly amongst the CoEs and those set the commonly accepted patterns for the proposed CoE to follow. Nonetheless, those services might differ on their form of presentation and the target groups involved. Furthermore, the rest of the services, that are unique in some of the CoEs might be beneficial in terms of inspiring new services for the current CoE. In essence, both the prevalent and the unique services are useful for the analysis, since they provide both best practices and innovative ideas for the functioning of the CoE.

The form of presenting the information found is a table featuring all the CoEs and the services provided by each of them. The most prominent of them in terms of appearances shall be considered for adoption in the next steps.

3.1.2 Services Description

After the existing CoEs are analyzed in terms of their services, the next step includes the presentation of ten of the most prominent services to be included in the CoE. The purpose of this step is to sort out which services are suitable for the CoE and which are not, based on their relevance, their prevalence in the analysis of the previous step and their score in certain criteria.

The first criterion these ten services must meet is the intellectual property creation. One of the most substantial outcomes of the HEIs functioning is the generation of intellectual capital. Which could be identified as the knowledge of an organization, including tangible (i.e., databases) and intangible (i.e., innovation, personnel experience) knowledge aspects related to knowledge (Abdikeev, 2019). One of the most prominent intangible forms of intangible assets that pertain to the knowledge of an organization is the intellectual property. According to Fisk (2009), intellectual property was introduced in 1845 in the United States of America. Even though it is considered a very complex and constantly evolving economic and legal notion (Virchenko et al., 2021), it could be described as the set of industrial properties, the exclusive “know-how” and the legal rights and copyrights for the aforementioned set (Abdikeev, 2019). It is considered a very powerful tool for the research and development of knowledge. The commercialization of intellectual property is a widely accepted aspect based on the relevant literature (Virchenko et al., 2021), with the intellectual property being increasingly considered beneficial for both the entrepreneurial (Poticha & Duncan, 2019) and the HEI (Kashyap & Agrawal, 2019) economic sustainability and competitiveness. Considering this, the CoE will benefit greatly generating innovative solutions and knowledge sets and providing them for commercial purposes, and thus the potential intellectual property should be considered where examining a service.

Complementary to the previous criterion, which focuses on intellectual property and the fact that it should be commercialized, one other criterion is the potential revenue streams that the CoE could generate in order to sustain itself. There are literature pieces that propose that the funding scheme influences the rationale behind the governance of the CoE (Borlaug, 2016). That might pose a challenge in governing the CoE in accordance to the expectations and its research objectives, since the funding schemes might change. Hence, the revenue streams could provide support for a self-sufficient CoE and it is logical to examine them in the context of the selection of the most suitable services for the CoE.

The next two criteria, might seem like considered mutually exclusive, but they are necessary for the success of a digital governance CoE. The former is whether or not the service provides value considering the Greek standards, while the latter is the extroversion of the service, meaning if it provides value in the context of the international standards. As a basis, a service should address the needs and particularities of the Greek digital ecosystem, since it is a Greek CoE. However, in order for the service to achieve the proper level of scientific adequacy, widespread adoption and economic feasibility the service should be carefully constructed in a way that is useful and inclusive for users beyond Greece. It needs to keep pace with the international advancements of the digital governance field, be in alignment with the best practices provided by international experts and it also needs to be open for collaboration with other organizations and CoEs.

Finally, the services included should be inclusive to young researchers, practitioners and students of the digital governance sphere, since they are going to implement, expand and evolve the existing knowledge base and services provided by the current and by the rest of the CoEs. They are also a demographic that is expected to benefit greatly from the utilization of the CoE's intellectual capacity and the services provided, since they can learn about the current research and development initiatives in the area of digital governance following a more practical and interactive approach.

After the ten services are selected, they are going to be described, in a non-extensive manner, and the next steps can utilize some of these descriptions.

3.1.3 Services Specification

Three of the previously described services are planned to be specified. These are considered the most essential services provided by the CoE. Once they are specified, they are easily designed and developed in order to be incorporated in the organizing structures of the CoE.

Since services can provide various forms of economic utility, a service specification is beneficial in terms of determining which service is the most adequate (Lisan, 2018). Virtually, service specification is an analysis of the requirements, the objectives and some of the fundamental aspects of a provided service, such as actors, information flow and presentation form. It is used in order to specify the directions that should be followed during the design and implementation of the service, while also giving a wholistic view of the service experience. Generally, the service specification is more sophisticated than a simple description of a service, hence the services that are going to be specified are less than the ones that are going to be described.

The service specification is a valuable method of analyzing a service, that applies in multiple scientific fields, from management and business administration to software engineering and telecommunications. There are numerous ways of conducting a service specification process. The most common one is through a written document, which includes fundamental aspects of the service clarified, such as the actors, the use cases, the interface, the operations and the data models (Lutz et al., 2021). It is important to state that in this level the descriptions are not technologically oriented, focusing mostly on the organizational aspects that pertain to the service. The exact models of service specification vary depending on the context of the service. Some of the examples of the discrete models of service specifications pertain to the procurement process (Holma et al., 2020; Lisan, 2018), the business service outsourcing (Molin and Åge, 2017) and even the clinical pharmacy operations (Greenwood et al., 2021). Each has its own benefits and scope of adoption, but there can always be combinations of the already established forms in order to provide a more customized result.

However, the service specification model can also be represented in ways other than written documents. More specifically, there is a plethora of literature studies that propose ontological or semantic specification methods. One of the most prominent representation languages used in literature for that kind of way of specification is the Ontology Web Language (OWL) (Subbulakshmi et al., 2017; Qu et al., 2017; Popp, Hoch and Kaindl, 2017). One also significant language used for specifying services is the Unified Modeling Language (UML) (Blal and Leshob, 2017).

In this case, the preferred medium of specifying the services provided by the CoE is the written document. An ontological representation would offer certain benefits, but it would mostly benefit the technological design of the service rather than the service organization and content management. The document providing the service specification contains the fundamental aspects of a service, based on previously mentioned literature studies and based on best practices found in credible institutions that are involved in ICT and non-ICT services. The service specification should be sufficiently described in terms of the details provided, in order for the implementation to be ready to be initiated with the information given.

It is important to clarify that in this stage the information provided does not include the actual content of the services, but rather the structure and the fundamental aspects of their functioning. This is reasonable, since some of the services' content is to be provided by experts of the field and others' by research conducted under the auspices of the CoE.

3.1.4 Service Creation

The services provided by the CoE vary in terms of their medium of provision, their actors, their complexity and other factors. The services that are created or conducted in collaboration with external actors, such as organizations, researchers, companies and other institutions are the most difficult to create individually by the CoE individually.

In this step, the aim is to create one service of the three specified ones. This service should be individually provided by the CoE to its members. Additionally, its technological infrastructure should not be extraordinarily complicated, because that requires specialized experts to design and implement the service in order to be well-implemented.

The form of the service creation depends on the exact service that will be decided. Its content may not correspond to the final version of the service, since it will be examined by the members of the CoE. Furthermore, since CoE will oversee research initiatives, then the service might evolve over time.

3.2 Methodological Objectives

The methodological steps act as a compass for the actual research process, with the four steps mentioned in the previous section being essentially the ones that are planned to be followed. Each step is founded on the relevant literature, in order to construct the analysis of the services regarding the CoE following the best practices that have previously been recorded.

There are some quantitative and qualitative factors that might be of importance concerning the organization of the research process. These factors mostly refer to the CoEs examined in the first step, since they are the foundation of the research that will eventually lead to the creation of the services.

3.2.1 Centres and References

The number of the research centers that are going to be examined in order to identify the currently provided services need to be over 30. This way the analysis will possess a representative sample of

the current situation. The centers should not necessarily be CoEs and their thematic scope can include subjects other than digital governance as well. The objective is to include research centers that provide similar services to what a CoE that is oriented around digital governance would do, regardless of the actual organization form. Consequently, it is possible that the centers that will be selected may be involved primarily in fields like policy making, digital transformation, digital innovation and others.

One additional note that needs to be made is the fact that the CoEs (the term is being used for all intents and purposes even if some of the centers selected are not actually CoEs), are diverse in their approach of contributing in the research and development of digital governance. Some of them are purely academic, with a larger institution, like a university, overseeing the operations, while others are more independent. Their culture can also differ, with academic, activist, advocative and even entrepreneurship orientations being included. Finally, the different countries where the CoEs are hosted can also lead to differences in the priorities of the provided services or in the way of providing their services.

The references for finding the CoEs that are being examined are the internet search engines as well as some university webpages that are eminent in the scientific field of digital governance. The website of each CoE is being provided.

3.2.2 Challenges and Assumptions

The problems that might occur during the analysis of the services pertain to the fact that there is not a clear consensus on which services are more necessary for the establishment of such a CoE. Furthermore, there is not an apparent consensus on the best form of presenting a service based on both the literature and the institutions that operate in the Greek market of digital governance. There are some directions and some common practices, but the possibility that the final services and even their forms will be debatable is strong.

It is reasonable to assume that while the analysis, the specification and finally the creation of the services follows the guidelines found in literature, some of the aspects that are being presented are results of individual choices. Furthermore, the design choices of providing the services assume the existence of a functioning digital platform that can host the services mentioned in the next chapter. That includes the technological web infrastructure to host and does not require separate design and specifications for the website itself or the non-operational requirements of this platform and its systems or the systems to which it is interconnected.

Finally, it is important to clarify that the services emerged, their provision to the public and their design is brought according to the needs of the Greek digital ecosystem members, as well as the needs of the institutions inside this ecosystem. The services might differ in the case that the CoE correspond to another country, so the findings of this study can be incorporated to external ecosystems with the appropriate adaptation. The results of this study are provided with the Thesis document.

4

Results

4.1 Analysis of similar Centres

This section includes the analysis of the relevant CoEs and their services. The status quo is provided through two tables, one for the demographics and the organization forms of the CoEs and one for the services provided by them. The most commonly found ones are noted in order to be considered for the inclusion in the CoE organized.

4.1.1 The Digital Governance Centres

The CoEs selected are 38, from 24 different countries, 34 distinct cities and from 30 institutions that support them, while 4 of them are independent. Table 1 provides the details of the 38 CoEs.

Table 1. Centres and their details

Name	Country	City	Parent Institution	Website
Digital Governance Research Centre (DGRC)	Greece	Samos	University of the Aegean	https://www.dgrc.gr/en/
Herite Centre for Digital Governance	Germany	Berlin	Hertie School	https://www.hertie-school.org/en/centre-for-digital-governance
National Center for Digital Government (NCDG)	USA	Amherst, MA	University of Massachusetts Amherst	https://www.umass.edu/digitalcenter/
Digital Governance Lab	Estonia	Tallinn	Tallinn University of Technology	https://digigovlab.ee/
The Hague Centre for Digital Governance	Netherlands	Leiden	Leiden University	https://www.universiteitleiden.nl/en/governance-and-

				global-affairs/institute-of-public-administration/the-hague-centre-for-digital-governance
Institute on Governance	Canada	Ottawa	Independent	https://iog.ca/
Digital Governance (DIGOV)	Netherlands	Rotterdam	University of Leeds, Erasmus Rotterdam University, Bar-Ilan University	https://digov.eu/
Centre for Digital Governance	India	New Delhi	National Institute of Urban Affairs	https://www.niua.org/centre_for_digital_governance
Center for Digital Government	USA	Folsom, California	Independent	https://www.govtech.com/cdg/
Centre for Digital Transformation – CeDiT	Norway	Agder	University of Agder	https://cedit.uia.no
Roy and Lila Ash Center for Democratic Governance and Innovation	USA	Cambridge, MA	Harvard University	https://ash.harvard.edu/
Open Government Partnership	USA	Washington, DC	Independent	https://www.opengovpartnership.org/
Practus Digital Governance Center	Estonia	Tallinn	Practus, Rubiks Digital	https://practus.eu/
Centre for International Governance Innovation	Canada	Waterloo, ON	Independent	https://www.cigionline.org/
Digicampus	Netherlands	Delft	Delft University of Technology	http://www.dedigicampus.nl/
Center za pametna mesta in skupnosti	Slovenia	Ljubljana	JSI - Institut "Jozef Stefan"	http://cpms.ijs.si/en/home-en/
East European Center for Research in	Romania	Timișoara	West University of Timișoara (Universitatea de	https://ecreb.ro/

Economics and Business			Vest din Timișoara)	
Innovation Centre for the Information Society	Spain	Las Palmas	University of Las Palmas de Gran Canaria	http://www.cicei.com/
Research Center of the University of Economics and Public Administration Management in Bratislava	Slovakia	Bratislava	College of Public Administration Economics and Management	http://www.vsemvs.sk/VedaAVyskum/CentrumPreVyskum
Centre for eGovernment	Norway	Agder	University of Agder	https://eforvaltning.wordpress.com/
e-Governance Academy	Estonia	Tallinn	Government of Estonia, Open Society Institute (OSI), United Nations Development Program (UNDP)	https://ega.ee/
Operating Unit on Policy-driven Electronic Governance	Portugal	Guimaraes	United Nations University	https://egov.unu.edu/
eGovLab	Sweden	Stockholm	Stockholm University	https://egovlab.eu/
Research Centre for Government IT	Denmark	Copenhagen	IT University of Copenhagen	https://en.itu.dk/research/research-centre-for-government-it
Leading Innovation & Knowledge for Society - LINKS Foundation	Italy	Torino	Politecnico di Torino	https://linksfoundation.com/en/links-foundation/
NEGZ - The National E-Government Competence Center	Germany	Berlin	University Koblenz-Landau	https://negz.org/
Czech Institute of Informatics, Robotics and Cybernetics	Czech	Prague	Czech Technical University in Prague	https://www.ciirc.cvut.cz/

Department for e-governance in business and administration	Austria	Krems	Danube University Krems	https://www.donau-university.ac.at/en/university/faculties/business-globalization/departments/e-governance-administration/centers/center-for-e-governance.html
INSEAD Corporate Governance Centre	France	Fontainebleau	INSEAD	https://www.insead.edu/centres/corporate-governance
Digital Technologies Center	Poland	Gdańsk	Gdańsk University of Technology	https://pg.edu.pl/en/research-university/digital-technologies-center
CSC – IT Center for Science	Finland	Espoo	Finnish state and higher education institutions	https://www.csc.fi/en/home
Leuven Centre on ICT	Belgium	Leuven	KU Leuven	https://set.kuleuven.be/LICT
Public Administration's Centre of Information Technology (IK)	Hungary	Budapest	Budapest University of Technology and Economics (BME)	http://ik.bme.hu/en/intro
Center for the Study of Democracy (CSD) - “building bridges between scholars and policy-makers”	Bulgaria	Sofia	Independent	https://csd.bg/
Digital Governance Lab (DGL)	Canada	Regina	University of Regina	https://www.digitalgovernancelab.org/
The GovLab	USA	Brooklyn, NY	New York University	https://thegovlab.org/
Digital Government Lab	Austria	Vienna	Internet Institut Wien	https://internet-institut.wien/digital-government-lab/

Digital Governance Lab	Germany	Konstanz	University of Konstanz	https://www.polver.uni-konstanz.de/en/mergel/
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It is visible through the Table 1 that aside from the digital governance, some of the thematic directions that the CoEs are following include innovation, democratic governance, international governance, corporate governance, smart cities, economics, business and public administration, while some of the centres are focusing on more technologically oriented aspects, like informatics, robotics and cybernetics. That can be safely considered an indicator of the wide influence of digital governance towards a plethora of neighboring scientific fields.

4.1.2 Basic Services Provided

In this section, there are three tables (Table 2, 3 and 4) which include the fundamental services that are provided by the CoEs and there are relevant to the digital governance scientific field. In the end of each table there is the exact number of CoEs that provide the specific service, based on its column.

It is important to note that there might be services that are not presented under the same title, but fundamentally are providing the same outcome. These are grouped under the same category of services. For instance, some CoEs address the community building activities as meet ups, while others conduct more formal events, but they can be grouped together, since the outcome is virtually the same. Also, the fact that some of the CoEs provide fewer services compared to others does not imply anything about their well-functioning or their overall performance, since they might be concentrated on fewer directions, provide niche services or even have some other services or duties that are not related with digital governance and thus are not mentioned below.

Table 2. Centres and their Services (1/3)

Name	Blog	Research - Studies Library	Standards Library	Training - Teaching	Events - Meet Ups - Communities	Funded Projects	Consulting
Digital Governance Research Centre (DGRC)	X	X	X	X	X	X	X
Herite Centre for Digital Governance	X	X		X	X	X	X
National Center for Digital Government (NCDG)	X						

Digital Governance Lab	X	X		X	X	X	
The Hague Centre for Digital Governance		X		X		X	
Institute on Governance		X		X	X		X
Digital Governance (DIGOV)	X	X		X	X		
Centre for Digital Governance						X	X
Center for Digital Government		X			X		
Centre for Digital Transformation – CeDiT		X			X	X	
Roy and Lila Ash Center for Democratic Governance and Innovation	X	X		X	X	X	
Open Government Partnership	X	X		X	X	X	
Practus Digital Governance Center		X					X
Centre for International Governance Innovation	X	X		X	X		
Digicampus		X					X

Center za pametna mesta in skupnosti		X			X	X	
East European Center for Research in Economics and Business		X		X	X	X	
Innovation Centre for the Information Society	X	X		X		X	X
Research Center of the University of Economics and Public Administration Management in Bratislava		X		X	X		
Centre for eGovernment		X		X	X	X	
e-Governance Academy	X	X		X	X	X	X
Operating Unit on Policy-driven Electronic Governance	X	X		X	X	X	
eGovLab	X	X		X	X		
Research Centre for Government IT		X			X		
Leading Innovation & Knowledge for Society - LINKS Foundation		X		X	X	X	

NEGZ - The National E-Government Competence Center		X			X	X	
Czech Institute of Informatics, Robotics and Cybernetics	X	X		X	X	X	
Department for e-governance in business and administration	X	X		X	X	X	
INSEAD Corporate Governance Centre	X	X		X	X	X	
Digital Technologies Center		X				X	
CSC – IT Center for Science	X	X		X	X	X	X
Leuven Centre on ICT	X	X		X	X	X	X
Public Administration's Centre of Information Technology (IK)		X				X	X
Center for the Study of Democracy (CSD) - “building bridges between scholars and policy-makers”	X	X			X		X

Digital Governance Lab (DGL)		X					
The GovLab	X	X		X	X	X	
Digital Government Lab		X				X	
Digital Governance Lab		X		X			
Total	19	36	1	24	27	25	12

Table 3. Centres and their Services (2/3)

Name	Open Data - Data Sharing	Platform Compliance Assessment	Expanding Career Opportunities	Evaluation of States	Awards	Campaigns
Digital Governance Research Centre (DGRC)						
Herite Centre for Digital Governance	X	X				
National Center for Digital Government (NCDG)			X			
Digital Governance Lab						
The Hague Centre for Digital Governance						
Institute on Governance						

Digital Governance (DIGOV)						
Centre for Digital Governance						
Center for Digital Government				X	X	
Centre for Digital Transformation – CeDiT						
Roy and Lila Ash Center for Democratic Governance and Innovation			X			
Open Government Partnership						
Practus Digital Governance Center						X
Centre for International Governance Innovation						
Digicampus						
Center za pametna mesta in skupnosti						
East European Center for Research in Economics and Business						
Innovation Centre for the						

Information Society						
Research Center of the University of Economics and Public Administration Management in Bratislava						
Centre for eGovernment						
e-Governance Academy						
Operating Unit on Policy-driven Electronic Governance						
eGovLab						
Research Centre for Government IT						
Leading Innovation & Knowledge for Society - LINKS Foundation						
NEGZ - The National E-Government Competence Center						
Czech Institute of Informatics, Robotics and Cybernetics						
Department for e-governance in						

business and administration						
INSEAD Corporate Governance Centre						
Digital Technologies Center						
CSC – IT Center for Science						
Leuven Centre on ICT					X	
Public Administration's Centre of Information Technology (IK)						
Center for the Study of Democracy (CSD) - “building bridges between scholars and policy-makers”						
Digital Governance Lab (DGL)						
The GovLab	X					
Digital Government Lab						
Digital Governance Lab						
Total	2	1	2	1	2	1

Table 4. Centres and their Services (3/3)

Name	Opinions	Multimedia	Podcast	Advocacy	Impact Analysis	Simulation	Delegation Hosting
Digital Governance Research Centre (DGRC)							
Herite Centre for Digital Governance							
National Center for Digital Government (NCDG)							
Digital Governance Lab							
The Hague Centre for Digital Governance							
Institute on Governance							
Digital Governance (DIGOV)							
Centre for Digital Governance							
Center for Digital Government							
Centre for Digital Transformation – CeDiT							
Roy and Lila Ash Center for Democratic							

Governance and Innovation							
Open Government Partnership			X				
Practus Digital Governance Center							X
Centre for International Governance Innovation	X	X					
Digicampus							
Center za pametna mesta in skupnosti							
East European Center for Research in Economics and Business							
Innovation Centre for the Information Society							
Research Center of the University of Economics and Public Administration Management in Bratislava							
Centre for eGovernment							
e-Governance Academy			X				
Operating Unit on Policy-driven							

Electronic Governance							
eGovLab							
Research Centre for Government IT							
Leading Innovation & Knowledge for Society - LINKS Foundation							
NEGZ - The National E-Government Competence Center							
Czech Institute of Informatics, Robotics and Cybernetics							
Department for e-governance in business and administration							
INSEAD Corporate Governance Centre				X			
Digital Technologies Center							
CSC – IT Center for Science							
Leuven Centre on ICT							
Public Administration's Centre of							

Information Technology (IK)							
Center for the Study of Democracy (CSD) - “building bridges between scholars and policy-makers”							
Digital Governance Lab (DGL)							
The GovLab							
Digital Government Lab					X	X	
Digital Governance Lab							
Total	1	1	2	1	1	1	1

According to Tables 2, 3 and 4, the most popular services provided by the CoEs are the provision of research studies, the community meetings, the development of funded projects, the training, the news – blog presentation as well as the consulting service. Besides them, the services distribution amongst the CoEs is considerably sparse. It is visible through the tables that the widely adopted services are provided by the vast majority of the CoEs (as it can be seen in Table 2), while the rest of them are implemented by one or two CoEs (as it can be seen in Tables 3 and 4). The individual, sparsely implemented services might imply the singular research or otherwise directions of each CoE.

The previously mentioned tables can be insightful for both identifying the standard practices of the existing CoEs, which are essentially the ones that are commonly found, and monitoring the needs of the field, through examining which of the services that are sparsely provided could be more advantageous and thus could be valuable additions to the services that are provided by the proposed CoE.

4.2 Digital Governance Research Centre Services Description

Digital Governance Research Centre (DGRC), which is the name of the CoE proposed, is an institution aiming at studying, educating on, planning, implementing and supporting modern

approaches and methodologies for governance at local, national and international level. One of the main ways DGRC pursues that is through the collection of collaborative knowledge and expertise in the subject of digital governance from both the public and private sector, the academia and the civil society.

DGRC is planned to present its services through an online platform. In order to decide which services are better suited for DGRC to provide, the existing CoEs' services are rated on a scale of 1 to 10. The rating metrics correspond to the five criteria of the description of the services, namely the Intellectual Property creation, the Revenue creation, the relevance with the Greek Market Standards, the International Potential for scalability and the Involvement of the Students. Table 5 presents all the services' scores, with the total rating corresponding to the average rate of all five criteria.

Table 5. The Services' Scores

Service	Intellectual Property Creation	Revenue	Greek Market Standards	International Potential	Students' Involvement	Average
Blog	5	5	7	7	7	6.2
Research - Studies Library	10	7	8	8	8	8.2
Standards Library	8	8	10	8	5	7.8
Training - Teaching	10	9	9	7	7	8.4
Events - Meet Ups - Communities	4	6	7	7	8	6.4
Funded Projects	9	10	8	8	10	9
Consulting	9	10	10	9	6	8.8
Open Data - Data Sharing	5	4	10	10	8	7.4
Platform Compliance Assessment	6	10	8	8	4	7.2
Expanding Career Opportunities	7	8	10	9	10	8.8
Evaluation of States	6	8	10	8	4	7.2

Awards	6	7	9	8	8	7.6
Campaigns	5	5	7	7	6	6
Opinions	5	4	6	5	4	4.8
Multimedia	9	8	7	7	7	7.6
Podcast	7	8	8	7	6	7.2
Advocacy	7	4	8	7	7	6.6
Impact Analysis	9	9	9	8	6	8.2
Simulation	6	7	8	8	7	7.2
Delegation Hosting	5	7	7	7	4	6

It is important to clarify that this analysis is not absolutely indicative of which services are going to be selected for DGRC. That is due to the fact that some of the services may score sufficiently in the five criteria but be out of scope for DGRC, or they can be too complicated to be implemented. Additionally, it is fairly possible that a service of DGRC combines aspects of more than one Table 5 service, in order to achieve more comprehensive results.

The next sections include the descriptions of the ten services selected for DGRC and the explanation of their selection, based on the five criteria and their contribution to the CoE.

4.2.1 Projects Development

The research orientation of the CoE is not merely theoretical, but rather it combines the actual implementation of solutions in the area of digital governance with the state-of-the-art theoretical foundations found in relevant literature. As a result, one of the most prominent services of DGRC is to provide a set of developed projects, some of which can be funded by large institutions. The projects that are implemented under the auspices of DGRC can be directly coordinated by the CoE or they can be outsourced to collaborating institutions, companies or even academic groups, like students, with the CoE contributing in various ways in the development or the dissemination of the projects.

The service itself is fairly relevant amongst the existing CoEs, with the funded projects development being provided by 25 existing CoEs. This service instance scores the highest score in the five criteria ranking, with its average score in all five criteria being 9 out of 10. It provides a solid opportunity for the CoE to generate sets of intellectual property during the research and development phase, it is an excellent revenue stream, it can advance both the Greek and the international digital governance field, providing solutions that can be implemented covering the market needs and it is one of the most feasible ways of including young researchers and students that are interested in the field of digital governance, who could boost their skills through being part of the development of a funded project.

The projects that DGRC has implemented, coordinated, disseminated or just have contributed to can be uploaded in the CoE's digital platform. This way the platform's users can be informed about the projects and they can also contribute in the further advancement or dissemination of the projects. Indeed, this co-development of projects under the auspices of DGRC is the linchpin of the future of digital governance ecosystem in Greece, with the CoE being the meeting point and the collaboration platform for the to-be experts and professionals of the field. DGRC can not only enhance the collaborative development of the field but also gain expertise and gather best practices emerged from the projects adopted by it and utilize this expertise for the rest of its services.

4.2.2 Consulting

Having the proper expertise in the digital governance field, both in terms of the Greek and the international ecosystem, DGRC has the potential of being one of the most highly sought-after consulting institutions. The extensive knowledge of the digital governance ecosystem can be employed to assist public organizations to achieve optimal digital transformation and business process re-engineering following digital standards. The same applies for private organizations, who wish a reliable analysis of the best practices for their business for it to be evolved in terms of digital maturity and efficiency increase through digital means. Finally, it can also be incorporated by legislative bodies, branches and government agencies in order to provide consulting in new regulatory frameworks and government initiatives that pertain to digital governance.

Consulting is a service that reflects the experience, the prominence and the reliability of the whole set of services provided by DGRC, which have equipped it and its members with exceptional knowledge of the digital governance that can benefit the consulted organizations. Consequently, this specific service is not only a functional service, but also an indication that the CoE is being recognized for its contribution.

The consulting service can be interpreted as a combination of several previously found services in the existing CoEs. Firstly, consulting itself is widely adopted as a service, with 12 CoEs providing it. However, there are also relevant services that could be broadly considered consulting. Specifically, platform compliance assessment, which is the service of assessing an organization's digital platforms in terms of its compliance with the relevant regulatory framework or even the best practices, and the evaluation of states, which can be interpreted as reviewing a city's, state's or even country's digital maturity and readiness, in terms of digital governance.

Consulting is the second most highly rated service, based on the five criteria, with an overall score of 8.8 out of 10. It has the potential to generate highly sought intellectual property, it is an outstanding revenue stream and it is relevant in both the Greek market, which presents greater demand, and internationally.

4.2.3 Expanding Career Opportunities

An equally highly rated service is the one connecting students and young professionals with existing businesses or organizations that seek employees. The fundamental idea is presenting career opportunities and even help the young professionals to expand their career options with training programs and references. With an overall score of 8.8, this service would be an advantageous

addition to the CoE, since it could enable the active participation of students and young professionals, it would meet the needs of the current Greek and international market and it could provide a steady revenue stream for every company that is collaborating with the CoE in order to attract potential employees.

The projects on which the students can be employed can be solely under the auspices of the partner company or they can even be jointly developed by the CoE and the company. It is essential to note that the term company is used for the sake of simplicity. In fact, the collaborating institution on which the young professionals will seek employment can be a private company, a public organization, a non-governmental organization, an international or transnational institute or other legal entity that is interested in digital governance.

The ultimate goal is to expand the capabilities of the young members of the CoE, providing them with actual experience from the existing companies in the market. They can learn through practical examples and projects, enriching not only their hard but also their soft skills. One additional goal is to expand the community in terms of the collaborating parties. Finally, through this collaboration there is a steady increase expected, in both the projects that the CoE can implement and the collective knowledge inside the CoE. That is due to the fact that as long the members of the CoE are broadening their skillsets, the CoE can benefit by their experience, since they will give back in it.

4.2.4 Training - Teaching

The training and teaching service is probably the most direct connection with the HEI nature of a CoE that performs in the academic ecosystem. With an overall score of 8.4 out of 10, this service is certainly a necessary service to be implemented. It is an unprecedented opportunity for the CoE to generate intellectual property that will be widely distributed, providing steady revenue streams. Additionally, this service will be of paramount importance for both the Greek and the international market professionals, officials and policy makers, who will benefit the most out of the expertise of DGRC.

The exact form of the service can be provided by the digital platform. More specifically, DGRC can host a series of online courses that everyone can take through the website. The courses pertain to several scientific subdomains of digital governance and also some professionally related concepts. Characteristically, some of the online courses' themes might be the fundamentals of digital governance, interoperability, legal aspects of digital governance, public organizations' processes re-engineering, digital transformation in the private sector, entrepreneurship and digital governance, smart cities, digital participation and a plethora of others.

The methodology followed in these courses may follow several principles. There is certainly the objective of transferring as much knowledge as possible, but there is also the need for interactive content and practical examples in order for the trainees. Fortunately, a digital environment can accommodate the desirable interactive functionalities.

The academic experience of such a CoE is advantageous in the subject of tutoring the trainees and overseeing the potential assignments. That is due to the fact that DGRC possess not only the

field expertise required to organize and present the course material but also the teaching experience that is necessary to properly conduct the training course.

Aside from the asynchronous training, meaning the courses, DGRC may organize training events in various subjects pertaining to digital governance. This way of training provides the additional benefit of growing the community of the CoE and it also acts as a networking point for both the CoE members and the digital governance field.

4.2.5 Research

The research of a CoE is potentially the forefront of its services. Either derived from the implemented projects' results or from the individual members' analyses, the research outcomes of the CoE are expected to be highly sought-after, since the expertise and the knowledge concentration provided by DGRC are significantly advantageous for both the Greek and the international community.

The publications that come along with the research conduct, are one of the most crucial aspects of the academic nature of the CoE. Essentially, it is the main way of enriching the scientific community about the current affairs that are being observed, tracked and analyzed from the members of DGRC. Through academic conferences participation, journal submissions, contributions to book chapters, as well as editorial work and peer-to-peer review of current issues for scientific publications, the CoE aims to enhance the scientific community's knowledge on digital governance.

However, the publications are not limited in solely academic publications. There are ways of publishing annual reports or special issues in collaboration with other parties or independently as CoE. That way the publications have the opportunity to examine more specific or not so theoretical aspects in a less formal manner, thus reaching to a broader portion of the community.

Overall, the research service can be presented through the digital platform and it can be provided to the DGRC members freely. With a ranking of 8.2, this service can be an excellent opportunity to create intellectual property while disseminating cutting-edge knowledge about digital governance, expanding the CoE's community and involving young researchers in the process.

4.2.6 Certification

The certifications service is one of those not directly related to the existing ones, but it can be considered related to some of them. Most notably, the consulting service, which corresponds to outside institutions having their strategy, processes or infrastructure reviewed and receiving some insights on how to proceed in order to increase their digital readiness and increase their efficiency. The certification service expands on that, adding the potential of outside institutions agreeing on being reviewed and assessed in order to receive a certificate that acknowledges that they meet certain criteria.

The extensive technological and organizational knowledge provided by the CoE members can be effective in terms of defining the best practices a partner organization should follow in order to achieve better digital maturity and increase its efficiency. Following robustly designed tests and questionnaires, the CoE team is able to certify if the organization lacks in its digital capacity in

a transparent and well-defined manner. The initiative can be a great source of revenue with the additional benefit of expanding the CoE's network of collaborating external organizations.

4.2.7 Open Data Observatory

Openness and digital governance are terms that are interconnected. Digital readiness is often associated with the ability of the organization to use open standards, partially or even solely provide its infrastructure in an open-source way and generally adopt a culture of openness for the organization and its members.

Open data are an integral part of today's research and development. Studying several phenomena, statistics, performance indicators through data that are being publicly provided is a necessity for research, policy making, business strategy and a wide set of activities in the current ecosystem. Open data publishing can be fruitful especially for digital governance. That is due to the fact that a digital platform makes it easier to record, transfer, edit and publish the data. And since the functioning of governance related platforms in a digital environment is a great aspect of digital governance, it is safe to assume that open data are considered significantly relevant with digital governance.

Providing a medium for finding digital governance open data, their analyses and relevant reports is a service that is not yet widely adopted. Nonetheless, it is a useful service, particularly for depicting the Greek and international indicators pertaining to digital governance, and as a service it scores relatively high, with an average score of 7.4. The digital infrastructure supporting the service can be highly sophisticated, since the members of the CoE have adequate academic background. Thus, the service would be considerably valuable and it could help the academic community and the DGRC community.

4.2.8 Community Building Activities

The community building activities correspond to all the events, meet ups, forums and conferences organized by the CoE in order to bring the community members together and to share knowledge and insights. Essentially, they aim at expanding the DGRC community and the digital governance community in general. The digital platform can be the communication medium for the events and the activities provided by the CoE, with the members of DGRC being notified through the platform.

Most of the existing CoEs include some kind of communities nested inside them and they tend to organize events in order to actively involve their members and generate some value. This service is especially advantageous for the students and the young professionals, which are members of DGRC, since it provides them with the opportunity to meet with market stakeholders or experienced researchers, giving them the prospect of collaboration or employment.

4.2.9 Funding Mechanism

Another service that is not being provided by any existing CoEs is the one of the funding mechanism for business ideas that fall under the digital governance thematic category. Apart from connecting young professionals with the current market stakeholders in order for the former to acquire

employment or experience, the CoE aims to connect startup companies or generally companies that are in need of funding with the current market's venture capitalists who are interested in digital governance.

The digital platform will enable the startups to submit their idea, their products or services, their organization structure and the exact parameters of their request for funding. The CoE will then review the application and if it is deemed feasible it will proceed to the contact of the collaborating venture capitalists. The CoE is expected to have collaborations with some of the Greek venture capitalists that are relevant to the digital governance and the digital entrepreneurship. These will receive the submission and will then come up with a proposal for funding. It is possible that the CoE will be itself involved in the development or the funding process, acting as a catalyst between the two parties.

The funding service is one that can potentially lead to a revenue stream, if the parties proceed to a deal, and it is a great example of bridging the startup and the current Greek digital governance market.

4.2.10 News Cover – Blog

One of the most easily constructed service is the news cover – blog one. Essentially, it includes the provision of regular and special reports concerning the current status of digital governance. Articles about new legislative pieces, current developments in the digital governance or opportunities for events.

The content creation for this service is easily attained, even for the younger members of the CoE, who can operate this service without constant overseeing of their superior researchers. It is a great way of disseminating the news of the field and it increases the extraversion of the CoE. Overall, it is a simple service with notable potential for the CoE and its dissemination among the members and the external people.

4.3 Digital Governance Research Centre Services Specification

For this step, there are three out of the ten services picked in order to be specified. The selection is based on a combination of which are the most complicated services in terms of their design and which score the highest in the five criteria score. Taking these two factors into consideration, the three services that are chosen to be specified are the “Expanding Career Opportunities”, the “Training - Teaching” and the “Consulting” services.

The features examined in the service specification process are an extensive description of the service and its characteristics, the current need for this service, its aims and objectives, its target users, its dissemination level, its main process and the steps followed, the basic revenue and cost models as well as the risk analysis and some potential comments. The objective of service specification is to analyze extensively the services in order to be able to be implemented by the potential web developers and to be coordinated by the potential researchers of the CoE. The design specifications may differ in the final version; however, the service specifications will provide the basic direction.

4.3.1 Expanding Career Opportunities

4.3.1.1 Overview

Expanding Career Opportunities is a service that establishes the CoE as a bridge between the private sector and the students and young professionals, who are members of DGRC. It gives the opportunity to students, to-be-graduates, graduates and young professionals the opportunity to work to existing companies' projects for a short period of time.

The service assigns students to projects that have been proposed by collaborating with DGRC companies and institutions based on the categories of skills the students wish to practice and based on the demands of the individual projects. The students are working on the projects for an agreed period of time and are getting the corresponding benefits (salary, insurance etc.) for this time period. The time period is agreed by both the company and the interested student.

The role of the CoE is to connect the two parties, to assign one of its faculty members to oversee the student's progress during the project work. This is due to the fact that the overall aim of the service is to further educate the students who are members of the CoE. If the work does not satisfy the education objectives or does not enhance the skillset of the student, then that is a problem that the overseeing faculty member of the CoE is responsible of addressing. Additionally, the CoE is responsible of deciding the provision of any educational material necessary for the student to meet the needs of the project.

After the conclusion of the time period decided, the CoE provides the student with a certificate describing both the skills developed during the project and the experience gained through the employment. Then the student may decide whether he or she will continue working for the company and the project or he or she will seek employment in another company under another contract. It is also possible that the student may utilize the service again.

4.3.1.2 The Need

Greece has a long record of poor performances regarding unemployment. According to Eurostat, Greece has the second higher unemployment rate in the European Union, as of November 2021, with 13.4%, only one position behind Spain, who reports an unemployment rate of 14.1% (Eurostat, 2022). However, the more disappointing results emerge from the youth unemployment rates (under 25 years old). Eurostat states that Greece has the highest youth unemployment rate in the European Union, as of November 2021, with 39.1% (Eurostat, 2022). Spain, which is the country that has the second highest youth unemployment rate, reports 29.2%. That is almost 10% difference between Greece and the second in youth unemployment rate country, which indicates that the youth unemployment situation in Greece is quite severe.

However, this picture does not correspond to the overall academic performance of the Greek universities. According to Mastersportal (2022), which took some of the most reputable university ranking platforms (i.e., Times Higher Education Ranking, Top Universities Ranking, Shanghai Jiao Tong University Ranking, U.S. News & World Report Ranking), the Greek universities score relatively high in the international rankings. Most of them manage to be included in the top 1000 universities globally in all rankings, and the ones that do not achieve that, still do not fall under the

1100 best universities globally. There are also some universities that manage to be included in the top 300 universities globally. And with 33% of population aged between 25 and 64 years old and 44% aged between 25 and 34 years old having attained tertiary education (OECD, 2021), one could argue that the Greek population is relatively skilled, so the question regarding the origins of the unemployment rates still exists.

Consequently, considering the high-quality studies the Greek universities provide and the relatively high percentage of people attained higher education, the high unemployment numbers should be attributed to other factors. This subject has gained significant interest by the researchers, as found in literature. There are several factors to which the phenomenon is attributed, with the variance in regional capacities (Monastiriotis and Martelli, 2020) and the family income, which is proven to be a solid indicator of the person's chances of being unemployed (Papadakis et al., 2020), being the most prominent of them.

At the same time, literature studies propose that the overall effects of internship programs to the long-term career development of the students are positive (Silliman, Edwards and Johnson, 2020). Aside from the work readiness of the students, the internship programs benefit the companies to, providing them with the opportunity to screen the best potential employees (Kapareliotis, Voutsina and Patsiotis, 2019). Literature also proposes several teaching models that include more practical knowledge that could lead to more certain employment by the current market. "Outcomes-based education" (OBE) (Wang, 2021) and "Learning-Practicing-Innovating" (Gao and You, 2021) stand as two of the most prominent examples, signifying that the directions of the research on this subject outline the importance of practical exposure to the market needs during the education.

All the aforementioned, as well as the literature studies that suggest that the proper career counseling the career and employment opportunities might be more auspicious for the students (Peng, Shih and Chang, 2020), reinforce the claim that the students would benefit greatly by the service presented. It will provide them with valuable market experience and knowledge, it will increase their chance of being actually employed and it will guide them in the current digital governance market.

4.3.1.3 Aims and Objectives

The fundamental aim of the service is to provide the early-stage professionals and practitioners of the field of digital governance with valuable work experience through their participation in relevant projects. This experience can expand their career opportunities, since they can have practical exposure to the market during their final undergraduate years and thus start searching for their first job more cognizant. Additionally, this experience can actually lead to the students finding their first job position, since if the cooperation of the short participation to the project is completed with the both parties satisfied it is possible that the company will hire the individual student.

However, there are other objectives behind the service, with one of the most prominent of them being the further connection of the digital governance market stakeholders. Brining as many companies, institutions and organizations together to form a network of partners with the goal of educating the to-be-professionals of the digital governance field is advantageous for both the market collectively and the companies participating individually. The companies will benefit by recruiting

enthusiastic individuals, further expanding their personnel capabilities and their projects options. They will also benefit by the educational role of the CoE for the students who work under their auspices, since in parallel with their employment, the students may request access to educational material to further expand their skillsets. On the other hand, the market collectively will benefit, since the next generation of professionals and practitioners in the field of digital governance will consist of more educated, experienced and active individuals, who gained their first experience through participation in various projects during their undergraduate years.

The CoE will also benefit from the operation of this service. Firstly, for a company, an organization or an institution to be a member of this program the CoE will receive a fee from them. This fee will cover operating costs, the overseeing faculty member's stipend, the costs for the educational programs that could be needed by the students as well as the dissemination and marketing costs. Secondly, the service will increase the visibility of the CoE, making it more appealing for the external entities to collaborate with it, not only in the context of this service, but also in the context of the co-creation of several research and practical projects. Thirdly, by increasing the competence of the CoE's youngest members, the CoE may benefit if these members continue to be actively involved in the CoE's work, with their newly acquired experience being utilized for the improvement of the CoE. Finally, the whole process can be of particular importance for the conduction of some of the other service of the CoE. For instance, the employment market needs, the students' employment preferences, the projects' particularities and the best practices emerged can be directions for fruitful research conducted by the CoE. Conversely, the educational needs emerged during the students' participation in the projects can provide insights on what training courses are in demand for the current market, which could be utilized by the CoE for that to create relevant courses.

Overall, the aims and objectives are in alignment with the CoE's, the students', the collaborating companies' and the market's best interest. The value generated during this service is also going to benefit the customers of the digital governance market and it could lead to more informed and experienced professionals for the next generation.

4.3.1.4 Target Users

This service is expected to target primarily students, young professionals and practitioners of the field of digital governance. They are the ones who are seeking to expand their skills and their expertise in the field. In addition, the service includes the cooperation with existing companies' representatives, who will contact both the CoE and the students in order to arrange the participation to the project.

The projects will be proposed by the company, submitted by the representative of the company and audited by the members of the CoE. After the projects' publication, the students will submit their interest and the CoE members will assign each student to a project. The selection of students for each project will be conducted solely by the CoE, in order to avoid any conflict of interest or acquaintance.

It is advantageous for the service's operation that the CoE is directly associated with a Greek university, thus the ties with the academic community and the students who could potentially benefit

from using this service are firm. It is also advantageous that the CoE has notable research and development activities, consulting activities and its members are knowledgeable of the digital governance ecosystem and its funded projects. Hence the CoE has connections with a number of private companies that act on this particular field who could opt to participate in this service.

The profile of the participating students ranges in accordance with their studies and the different projects they are interested in. However, the studies and the projects' thematic categories do not always absolutely coincide, since they might be looking for improving skills that do not traditionally fall under their study field. Still, it is not highly expected that the students will diverge from their field of studies in an unreasonable extent.

The students' grade of studies is not defined, however, it is safe to diminish the possibilities of acceptance for students who are too early in their studies, because they may have not acquired a complete understanding of their field of study, or that their academic responsibilities do not allow them to participate in the projects, for instance due to extensive study schedule. Nonetheless, these conditions do not explicitly exclude any student.

In the event that the students' numbers outnumber the available project positions, the selection of the students that will participate in the program will be based on merit and seniority. If however some students are senior and meritorious but have already participated in a previous project before, they will not be prioritized, since the objective is to provide as many students with the work experience as possible.

4.3.1.5 Dissemination Level

The dissemination of the service includes its promotion in the academic community, initially inside the university that hosts the CoE and later on the rest of the academic institutions around Greece. During this phase the students are expected to be contacted through their academic emails, the departments' webpages, their academic forums or any other ways of digital communication for events and opportunities. The students may apply directly to the website of the CoE, in the respective page for this service.

Regarding the companies and the organizations that are participating with their projects, the dissemination approach is planned to be more targeted. There is not a general email planned to be sent to all the relevant companies and organizations, but rather targeted emails to individuals with whom the board members of the CoE have cooperated in the past. That way some initial projects and some initial company positions will be posted in order for the service to operate and for the CoE to have a pilot version to show in more companies and organizations that are less connected with the CoE members.

Once the service operates with more autonomy, meaning it does not need the personal involvement of the senior academic members to reach out to companies and students, then there is space for more broad dissemination of the service and its results so far. Social media pages, advertisement through digital platforms, participation to networking events related to academia, entrepreneurship, youth development and others are only few of the examples of more expansive dissemination of the service.

4.3.1.6 *Technical Specifications*

The technological specifications regarding the operation of the service do not require a highly demanding online platform. Fundamentally, the online platform used as a main website for the CoE may contain a section or a page that could serve as a base for the service.

In order to be identified and considered for participation in the program one should be an authenticated member of the platform, meaning to have signed up in the platform. The users' categories are appropriately assigned, for students that will participate in projects, host organization stakeholders that will submit projects and faculty members that will be overseeing the whole process.

Once the user is logged-in and has created the respective profile, he or she can browse the webpage containing the ongoing projects. If the user is a project coordinator, representing a host organization he or she can upload a project through a specific page. In this page the coordinator states information about the project, the company, the student's profile and the overseeing faculty member's profile. Once the submission is recorded, it is assessed by a CoE member and it is uploaded. After that it is visible through the list of projects, with an assigned faculty member being recorded for it. If a student browses through the list and finds a project that is aligned with his or her interest, he or she can submit a declaration of interest through a specific form, stating aspects of his or her capabilities, studies, a CV and personal information. The faculty member's category has the rights of seeing the applications of students per project that is assigned to them. They can decide which of the applicant is selected for the project, which may be more than one. Once the selection is conducted the two parties contact through the coordination of the faculty member and decide the details of the contract.

The webpage of the project has the ability of filtering the content and presenting the content that reflects the capacity, the studies and the interests of the student and the host organization stakeholder. Additionally, its content should be provided in both English and Greek language and also being compliant with standards for users with disabilities, in order to be more accessible.

Many pieces of information regarding the project, the host organization or the student are standardized, in the way of lists, tables and predefined fields. That is due to the fact that they provide data that is more easily analyzed, in order to provide directions on the status quo of the projects that the students participate in. This could reflect on the market and its needs, orienting the training, consulting and research of the CoE, while also providing useful openly accessible information.

4.3.1.7 *Main Process*

The next figures present the main process of the Expanding Career Opportunities. In this presentation the participants are the Organization, which can be a company or an organization interested in employing a person for a project, a Student or Young Professional, who will be employed and the DGRC Faculty member overseeing the process.

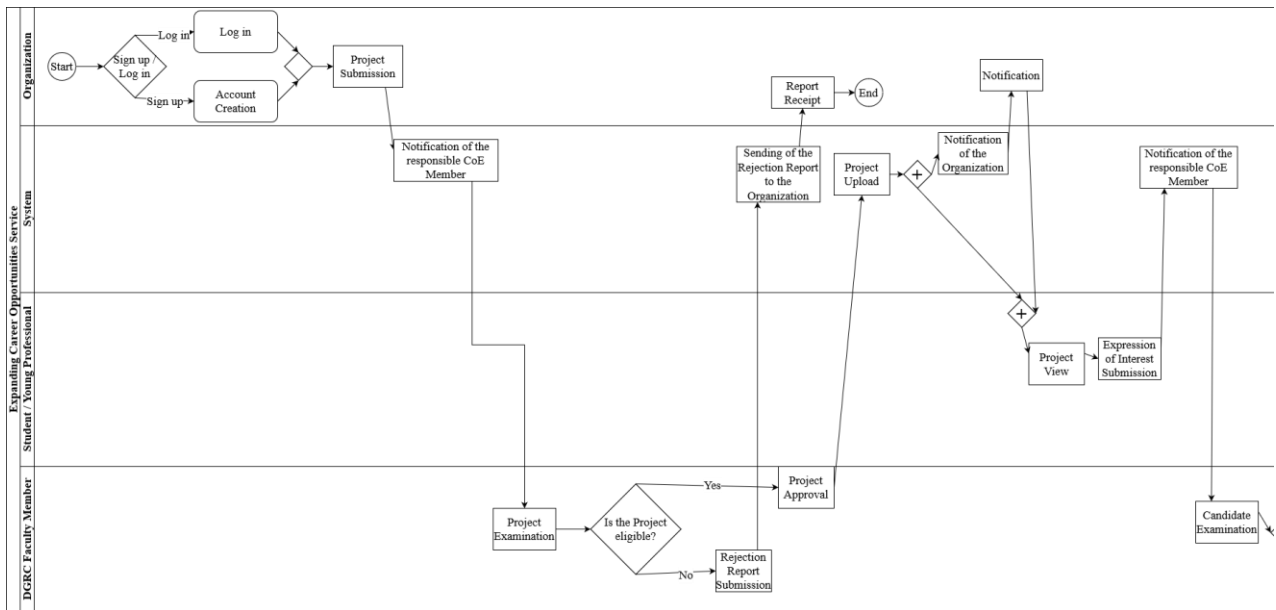


Figure 1. Expanding Career Opportunities Service (1/3)

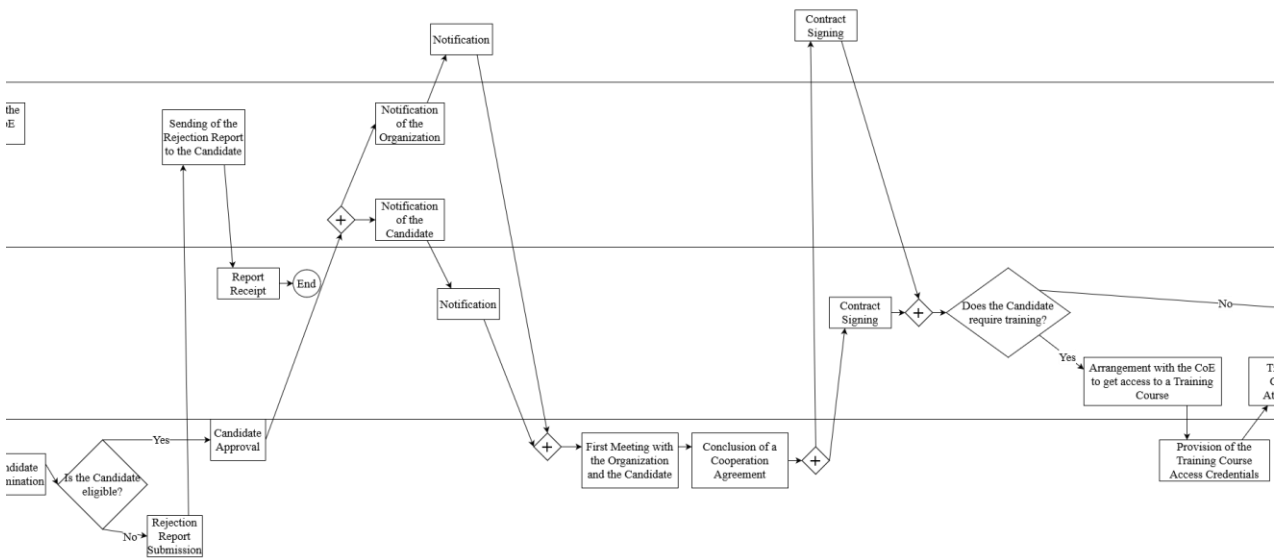


Figure 2. Expanding Career Opportunities Service (2/3)

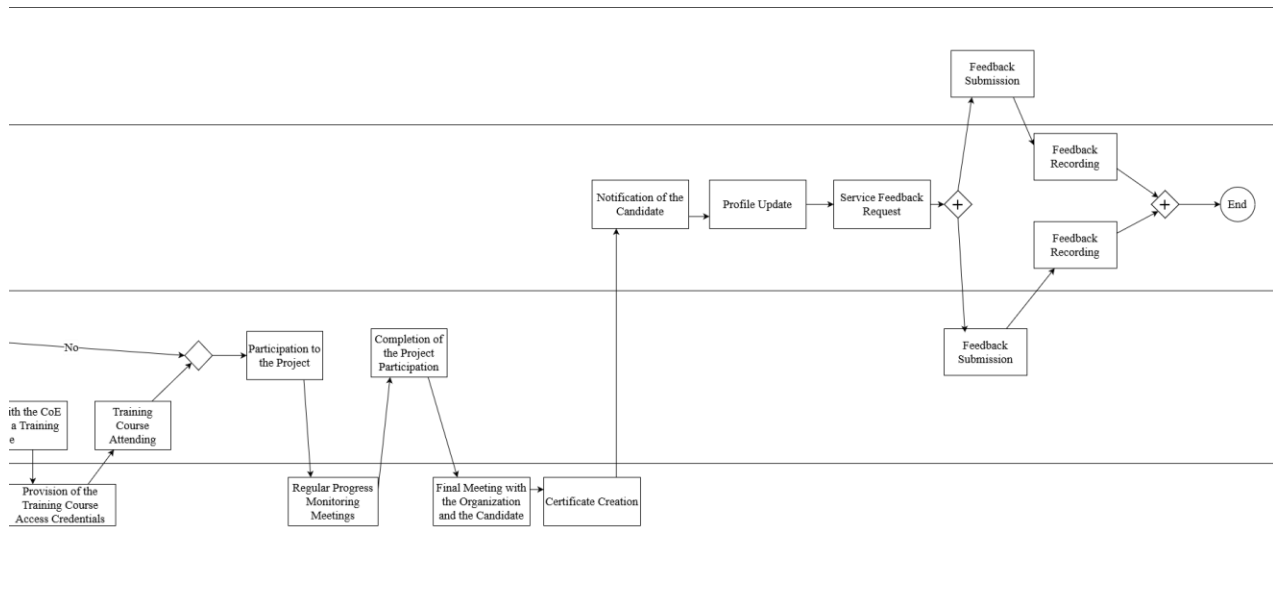


Figure 3. Expanding Career Opportunities Service (3/3)

In essence, the modelling of the main process of this service is presented in a Business Process Model and Notation diagram. Some parts of the diagram are presented as sub-processes (the rounded rectangles). Those parts are meant to be implied as mundane or easily conceivable processes, such as the process of logging in an online platform, so there is not real necessity in displaying the exact steps of these parts of the process.

4.3.1.8 Revenue Model

This section includes the revenue model for the Expanding Career Opportunities Service for the first three years. Each table includes three scenarios, one for the base case, one for the moderate case and one for the optimal case, both in terms of the clients and the final revenue. The following table presents the first year's revenue.

Table 6. Expanding Career Opportunities Service Revenue Model (1st Year)

Revenue Type	1st Year						
	Price (in €)	Clients			Revenue (in €)		
		Base Case	Moderate Case	Optimal Case	Base Case	Moderate Case	Optimal Case
Regular Projects Positions	3000	2	3	5	6000	9000	15000
Collaborating Companies Projects Positions	2500	5	8	10	12500	20000	25000
Affiliated Marketing	2600	4	6	10	10400	15600	26000

Companies Projects Positions							
Total		11	17	25	28900	44600	66000

The next table presents the second year's revenue.

Table 7. Expanding Career Opportunities Service Revenue Model (2nd Year)

Revenue Type	2nd Year						
	Price (in €)	Clients			Revenue (in €)		
		Base Case	Moderate Case	Optimal Case	Base Case	Moderate Case	Optimal Case
Regular Projects Positions	3000	3	5	10	9000	15000	30000
Collaborating Companies Projects Positions	2800	6	10	12	16800	28000	33600
Affiliated Marketing Companies Projects Positions	2800	6	8	10	16800	22400	28000
Total		15	23	32	42600	65400	91600

The next table presents the third year's revenue.

Table 8. Expanding Career Opportunities Service Revenue Model (3rd Year)

Revenue Type	3rd Year						
	Price (in €)	Clients			Revenue (in €)		
		Base Case	Moderate Case	Optimal Case	Base Case	Moderate Case	Optimal Case
Regular Projects Positions	3000	4	8	12	12000	24000	36000
Collaborating Companies Projects Positions	2800	8	12	15	22400	33600	42000

Affiliated Marketing Companies Projects Positions	2800	8	10	12	22400	28000	33600
Total		20	30	39	56800	85600	111600

The results emerged from the previous tables are several. Firstly, the pricing difference between the first year and the next two is notable, since the first year the pricing is lower in order to attract the initial companies to participate and hire students. This is especially true for the companies with which the CoE is collaborating in various projects, since they have already established trust with the CoE. One additional observation is the fact that as the years pass by and the reputation of the CoE's service intensifies, then the number of the companies and organizations participating is expected to grow.

4.3.1.9 Cost Model

This section provides the cost model of the Expanding Career Opportunities service. The calculation is based on how many working days are necessary in order for an instance of a service to be completed. The working units correspond to a completion of a program, in the three months, for each company's position. During this time period, the members that will be employed are a Faculty Member, a Technical Staff Member and an Administrative Staff Member. The Faculty Member will be employed for two work days per week during the first month, until the project position is matched to the student and one work day per week during the next two months. The Technical Staff Member will be employed for one work day per week on average during the whole service. The Administrative Staff Member will be employed in the process in consultation with the Faculty Member.

Table 9. Expanding Career Opportunities Service Cost Model

Cost Type – Stipends	Units – Working Days	Cost per Unit (in €)	Beneficiary Total Costs (in €)
Faculty Member	16	197	3152
Researcher	0	164	0
Technical Staff	12	122	1464
Administrative Staff	16	93	1488
External Expert	0	164	0
Total	44		6104

It is visible through the previous table that the service's personnel costs can be balanced with the service revenue.

4.3.1.10 Risk Analysis

This chapter includes the Risk Analysis for the Expanding Career Opportunities Service. It includes a Risk Matrix and a Risk Analysis Table. The former provides a set of potential risks clustered in relation to their impact and their probability, while the latter provides more descriptive categorization of the previous threats and their respective solutions. The next figure provides the Risk Matrix.

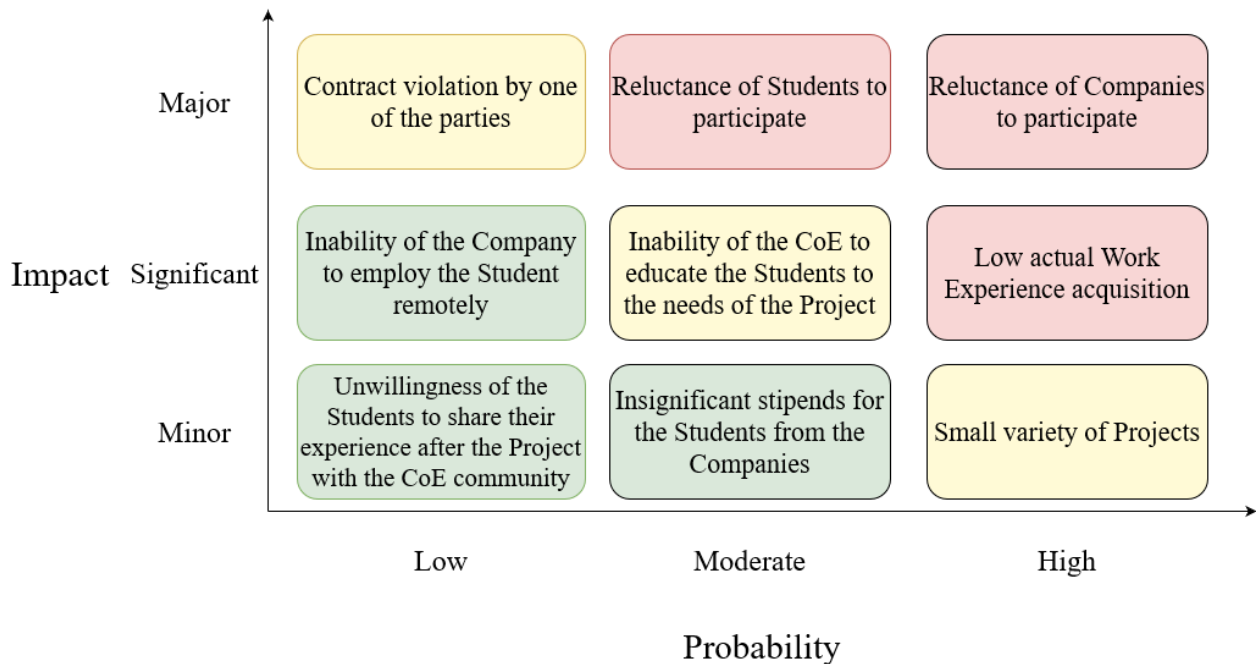


Figure 4. Expanding Career Opportunities Service Risk Matrix

The next table presents the Risk Analysis of the Service.

Table 10. Expanding Career Opportunities Service Risk Analysis

Risk Title	Probability	Impact	Prevention Plan
Reluctance of Companies to participate	High: The companies that are involved in the digital ecosystem are frequently involved in internship programs, where they can find temporary employees that can assign them whatever tasks they decide, without necessary concerning that the interns should acquire	Major: Without companies and organizations to host the students in their educative participation in projects, the program cannot operate and provide the students with the opportunity to work in relevant projects.	There is need for direct dissemination of the initiative and for marketing campaigns that will target the relevant companies in order for them to be willing to join the initiative and employ a student not just in the context of a short internship but for an educative program.

	some pre-agreed sets of skills.		
Low actual Work Experience acquisition	High: Since a company is a profit-driven institution and not a HER institute, its well-functioning and the delivery of the project results takes precedence over the knowledge transfer to the student being employed to it.	Significant: If the students do not acquire the specific knowledge which was initially the reason they joined the program, then the service does not differ from the regular internship program provided by the university.	Before the actual employment starts, a meeting takes place in order to agree on specific areas of expertise to which the student will be exposed to. This is also ensured by the contract signed. Also, the regular meetings between the supervising CoE faculty member and the student aim at giving the supervisor the chance to ensure that the student acquires the appropriate knowledge.
Reluctance of Students to participate	Moderate: Since the program is not directly correlated with a degree course from their university program, there might be cases of students who do not want to deviate from their studies and participate.	Major: The students are the centrepiece of the service, since they are the end users who are participating in the companies and acquire the benefits and the experience from the service.	One potential solution, beside the right marketing which will present the service as a useful experience that will prepare them for their future employment, is the agreement with the university to provide ECTs to the students participating in this service, in order to give them incentive.
Inability of the CoE to educate the	Moderate: It is possible that the project will require niche knowledge	Significant: In this situation the students will not be able to cope with the pace of	One potential solution would be a collaboration with external educational

Students to the needs of the Project	from the students and the CoE members will not have the capacity of teaching them.	the project and consequently they will not acquire the desired experience.	institutions, specialized in training courses in areas related to digital governance, whenever necessary.
Small variety of Projects	High: The projects related to digital governance that are in need of employment that can be filled by a student are not great in number or in thematic variety	Minor: Even if the variety is limited the projects can provide valuable knowledge to the students that can be utilized in their careers.	Suggestions of the less represented areas of expertise during the project submission form.
Contract violation by one of the parties	Low: The projects' needs may be underestimated, while the students' capacity to work effectively can also be proven inferior to what was normally expected.	Major: The student may underperform or the company may assign them more tasks or irrelevant with their educational objectives tasks.	The project company is examined in terms of its feasibility and workload and the student's capacity to deliver results is considered before being referred to work for the project.
Insignificant stipends for the Students from the Companies	Moderate: Since the companies are proposing real projects and not pilot or research ones, in order for the students to acquire the desirable knowledge, the companies may not provide high salaries to the students, since they cannot guarantee results based on their experience, which is limited.	Minor: If the company does not provide competitive stipends the students may not be able to cover their expenses during the work period and thus, they will be more reluctant to participate in the service.	If the stipends are indeed insignificant, the CoE may support the remote work, for the students to be able to work from their home towns in order to avoid renting and relevant costs.

Inability of the Company to employ the Student remotely	Low: Since the companies are interested in digital governance, it is unlikely that the projects will not include positions that could be operated remotely.	Significant: There are not plenty of students that will be able to rent an apartment in a new city, other than the one where they are studying, and thus their employment is becoming less appealing.	The CoE may ask the university's financial aid for the students that are not able to acquire significant stipends and their positions cannot be operated remotely.
Unwillingness of the Students to share their experience after the Project with the CoE community	Low: The opportunities to invite experienced digital governance practitioners to CoE events and share their insights with the community are planned to be plenty and it is unlikely that the students will not opt to participate.	Minor: The CoE community can find experienced individuals to share their insights beyond the specific service participants.	After the completion of the service, the supervisor should encourage the students to share their experience with their fellow students in those events.

4.3.2 Training – Teaching

4.3.2.1 Overview

The training and teaching service is the one that has the potential of reaching audiences beyond the closely related ones with digital governance. That is due to the fact that the content of this service has the capacity to be made accessible and easy to understand for the wide group of people out of the digital governance field who are interested in expanding their knowledge.

In this service the CoE has the role of the educational institution, bringing comprehensive online courses, online educational material and training activities for the users who are interested. This is based on the strong academic competence of both the faculty members, the research associates as well as the experienced professionals who consist the CoE. The service can be provided through various means, with the digital platform of the CoE being the most prominent of them.

The service has a solid potential of providing financial support for the CoE, since the training courses and the material can be provided, to a certain extent, under a fee for the prospective students. It is probable that a fair bit of the information will be provided open and free, especially in the educational material library, however, since the courses include intellectual property elements, it

would be reasonable to be provided under a fair fee. Additionally, the courses have a supervisor who assigns and assesses projects and also answers questions that might occur during the course. These are faculty members and thus require a stipend in order to dedicate some time from their academic duties and participate in the courses.

Additionally, the training service might include events that aim to train specific sets of individuals in a comprehensive way, virtually or in person. These events may be held publicly or be hosted by a certain organization or company. The aim is to briefly expose the participants to the state-of-the art, the methodologies and tools that pertain to digital governance.

4.3.2.2 *The Need*

Sarantis et al. (2019) have conducted an exploratory study on the current directions of the capacity building in the scientific field of digital governance, and found that while digital governance is a prominent research and development field, there is not significant number of departments devoted in studying this particular area and the online learning activities that are provided are mostly short education programs. That stands as an indicator for the necessity of expanding the set of currently provided education and training programs in this area. Literature identifies particular importance in expanding the current curricula that corresponds to the public administrations' needs (Ogonek et al., 2016).

One of the most eminent factors that make the implementation of such a program challenging is the multifaceted nature of digital governance. Jennings (2019) stated that various educational programs would address the issue on different aspects, namely political science scholars would focus on privacy and democracy while economists would focus on cost-effectiveness etc. It is safe to assume that this is a valid consideration, in view of the various neighboring scientific domains of digital governance identified in literature (Charalabidis and Lachana, 2020).

The Greek status quo, in particular, presents low levels of adoption of digital services, partly due to the fact that the digital government strategy needs to further prioritize the end-users, meaning the citizens, the customers, the public servants etc., implementing a customer-centric service delivery model (Karavasilis, Vrana and Zafiropoulos, 2016). However, this is not the only reason for the shortcomings of Greece in terms of digital readiness. The lack of the adoption of the “digital by design” principle and the lack of proactiveness as well as the defects in terms of the legislative improvement, its technological enhancement and the equal participation in the digital services are only few of the major hindrances in the digital enablement of the Greek public services (Kontogeorgis and Varotsis, 2021).

It is apparent that in order to usher more educated public officials, market stakeholders, researchers and students the curriculum has to be adjusted. However, providing large educational programs, like Master's Degrees, is not the optimal solution for both the lack of large departments or programs devoted to digital governance and the variance of issues and scientific points of views regarding digital governance and its status quo. As a result, online training courses can expand on specific topics and through different angles, while large education institutions, like universities, can focus on providing more major programs devoted to digital governance, which will provide more generic knowledge on digital governance.

The CoE can answer these needs for online training courses, since it is a smaller and hence a more agile HER, with adequate academic competence due to the participation of renowned academic and faculty members in it. Consequently, it is well-suited for shorter and more specialized education courses. In addition, since it is closely related with a university, the knowledge generated under the auspices of the CoE can enhance the large education programs provided by the university.

4.3.2.3 Aims and Objectives

The objective of this service is to cover the needs of the public officials, the market stakeholders, the researchers and the students that are related with the digital governance ecosystem. Since the CoE itself cannot exclusively provide a Master's degree in this area, even if the faculty members of the CoE participate in such a program through their academic work in a university, the way of contributing to the training efforts and the knowledge base surrounding digital governance is the provision of online training courses and short training events.

The objective of each training activity is to inform the participants over the current developments in various fields related to digital governance. For instance, the online course student should be able to understand the fundamental aspects pertaining to the specific topic of the course, implement methods and utilize certain tools that are mentioned as best practices in literature and also to be able to expand the knowledge base of digital governance ushering new information of the workplace and the projects that he or she represents. The idea behind this objective is that the students should not become merely more digitally literate in their workplace or their field of expertise, but rather to actively engage with the digital governance ecosystem, enhancing its knowledge base with their experiences and their expertise, rather than just consuming static knowledge. That way, not only the students have a motive to continue to expand their capacity but also the digital governance community grows. Afterall, it is that notion of being a part of a community that greatly influences the success of the online courses, as it is previously stated in literature (Sun and Chen, 2016).

However, in order for the information provision to be reciprocal, between the training platform and the students, there is a need for not just presentation of the educational material and static comprehension questions. There is also need for larger projects, where the students present individually or in small teams the practical applications of the knowledge received during the course in their employment positions. This way both the involved parties benefit. Basically, the students learn to identify the essence of the course that could be practically utilized for their work and the researchers and the faculty members that act as educational coordinators can monitor the alignment of the training outcome with the students' positions, hence identifying if there are needs in the orientation or the case studies used in the course.

Certainly, the service will benefit the CoE in terms of its feasibility. As it is typical with the intellectual property, the service and the educational material generated for it can be set once and they can serve multiple students that are willing to buy the courses. However, that does not imply that the service does not include certain costs, like the educational material corrections, renewals and reorientations when necessary, or the stipend for the educators to participate in this service, or the advertising costs. In general, the service has the potential of bringing significant monetary outcome in the CoE, improving its services and expanding its capabilities.

The training activities and events can also be advantageous, since they are a most direct way of reaching out to people who are interested in digital governance. The information provided in a single event cannot be compared with the course's, still, it is a promising training activity, with the exceptional potential of expanding the CoE community and improving the CoE's outreach to the public.

4.3.2.4 *Target Users*

The target group corresponding to this service consists of primarily public servants, private companies' employees, researchers and students that are interested in digital governance. They may be interested in beginning to explore the domain of digital governance since they realize the prominence of this field, which is disrupting the business-as-usual models of their work environments, or they may be already experienced in some area of digital governance and need specialization in some other.

For a training service to be successful, it should not exclude any interested individuals from participating. As a result, the educational content should be appropriately oriented to address the needs of the individuals that are less academically or professionally privileged, such as early-stage professionals or students, individuals with limited exposure to digital technologies, older adults, individuals with disabilities, individuals from underrepresented social groups. This may be addressed by incorporating several elements of successful training activities. For instance, creating diverse formats of information presentation (videos, textbooks, slideshows etc.), utilizing interactive optics, avoiding abbreviations, frequently asking for the trainees' feedback about the quality of the course and others are strongly advised practices in order to create an inclusive training environment.

The CoE members that participate in this service are various. The first and most important role of this service is the educational content creator, which may be a faculty member, a researcher or an external expert in collaboration with an academic member of the CoE. This role is responsible for initially creating the educational material such as the presentations, the slideshow, the textbooks, the quizzes and the project requirements for the courses. Frequently this role is collaborating with an external graphic and visual expert in order to create interactive content. Another prominent role is the one of the educator, which is typically a faculty member or an academic researcher. This role is responsible of coordinating the course, assessing the trainees' projects and answering their questions whenever necessary. A course may be coordinated with the help of an assistant, who may be a young researcher or a staff member, and who is responsible of solving technical and logistical problems that might occur. Finally, the CoE may be collaborating with dissemination specialists, whose job is to promote the courses to the appropriate audience and attract as many trainees as possible.

4.3.2.5 *Dissemination Level*

The starting point of the dissemination strategy includes excessive promotion of the service to the existing academic institutions, the online platforms that provide informative content relevant to education, the relevant news agencies and the individuals who are actively involved in promoting education opportunities through social media or in any other way. At this point, where the base of the service is not significant, the objective is to attain a solid group of trainees who will provide

their feedback for corrections and improvements and whose positive testimonials will convince more people to take the courses. It is probable that there will be a significant promotion cost at this point, not only for the collaborating parties, their affiliate shares but also because in order to promote the courses to their initial trainees there is a need for a generous discount, in order to make the service appealing. This is reasonable, since once the value and the quality of the service is recognized through the testimonials and the increasing number of people pursuing them, the normal pricing of the courses will be justified.

The next step includes the collaboration with external institutions, such as private companies, in order to provide training courses that focus on more niche topics. The dissemination of these initiatives relies heavily on the collaborating organizations' network and the individuals interested in this topic. So, this requires a more targeted promotion of the service, utilizing more highly sophisticated advertisement models and digital tools.

Throughout the normal operation of the service, the CoE's social media activity should remain engaged, with social media posts, visual content, newsletters and suggestions for the community. The community's engagement should be reciprocal, meaning that the social media pages should act as a mean of communication between the CoE and prospective trainees. It would also be advantageous to promote the testimonials, especially from past trainees and from market experts and stakeholders. These testimonials will affect positively the public's perception, and more specifically the prospective trainees' perception of the service, with the former serving as a hallmark for the educational service's quality and the latter as an indicator that the outcome of the service is highly sought-after in the field.

4.3.2.6 Technical Specifications

The technical capacity of the platform that hosts the service is not irregular compared to any other online course provider. The service will operate either directly hosted in a separate page of the CoE's platform or redirected to a different website, such as the ones including all the university's courses and lifelong education courses. Regardless, the service should be able to retrieve some data from the CoE's central system, such as the users' data. That is due to the fact that the certifications attained by the CoE may be positive features for a user that wishes to display them for other services, such as the one related to Expanding Career Opportunities.

In regard to the service itself, it should have the ability to display different sets of slideshows, textbooks and videos, for each course and each section of the course. It is desirable to have the ability to present the information simultaneously in the same section of the webpage, meaning to provide the slideshow or the audiovisual content in the same section of the screen, so the user can monitor them both without pausing. It is also desirable for the user to be able to read the subtitles, or the script of the presentation in the same section, considering the fact that there are prospective students that have hearing and other difficulties.

One major function that is essential to function properly is the one concerning the mid-roll questions that the trainees are expected to answer. In general, these are closed-ended questions and are calculated in total for the whole course section. It is possible that the educator will set a marginal score for a section to be considered successfully completed. Additionally, these questions should be

able to operate autonomously or to be activated and deactivated according to a specific time frame inside the presentation, which is up to the educator to decide based on the needs of the course section.

One additional function is the one of submitting course projects. These are activities that are assigned and implemented outside of the course sections and pertain to a certain subject taught in the course. The platform should have the capacity of presenting the scope and objectives of the project in the form of text, of receiving the submitted projects by the trainees and of counting down to the deadline, rejecting the projects that are submitted afterwards. The system should also notify the trainees about their grades in quizzes and projects after they are graded, either automatically or manually from the educators.

After the successful completion of the course, the platform should have the capacity of generating a course certificate, updating the user's profile. The system should be able to deactivate the certificate depending on its expiration date, if necessary. Some more practical functions include the logistics of the online courses, such as the various online payment methods support, the ticket emailing to the trainee and the affiliate link generation for the payments that correspond to a certain marketing source or individual.

The CoE members that are responsible for providing the educational material should be able to upload them in all the determined forms (e.g., presentations, videos, images, text documents, online links). They should be able to arrange and test the course sections' pages in order to ensure that the quality is the wanted. If certain elements need time frame designation, such as subtitles or scripts that need to be synchronized or questions that need to appear after a certain time frame, the platform should be able to accommodate such actions.

The faculty members and the researchers that act as educators should be able to regularly check the performance of the trainees, concerning the quizzes, and to have access to the projects that are submitted through the system. It is also desirable to monitor the trainees that have not submitted a project in order to notify them.

4.3.2.7 Main Process

The next figures present the main process of the Training – Teaching service. In this presentation the main participant is the Trainee, which is considered to be an individual, even though the service can operate with an organization purchasing training courses for some of the employees in a similar manner. There is also a DGRC Educator who can be a DGRC Faculty Member or an academic who is member of the CoE. For the sake of simplicity, the role of both the course affiliate and the technical assistant of the course are not included, since the main process diagram corresponds to the user perspective taking the course.

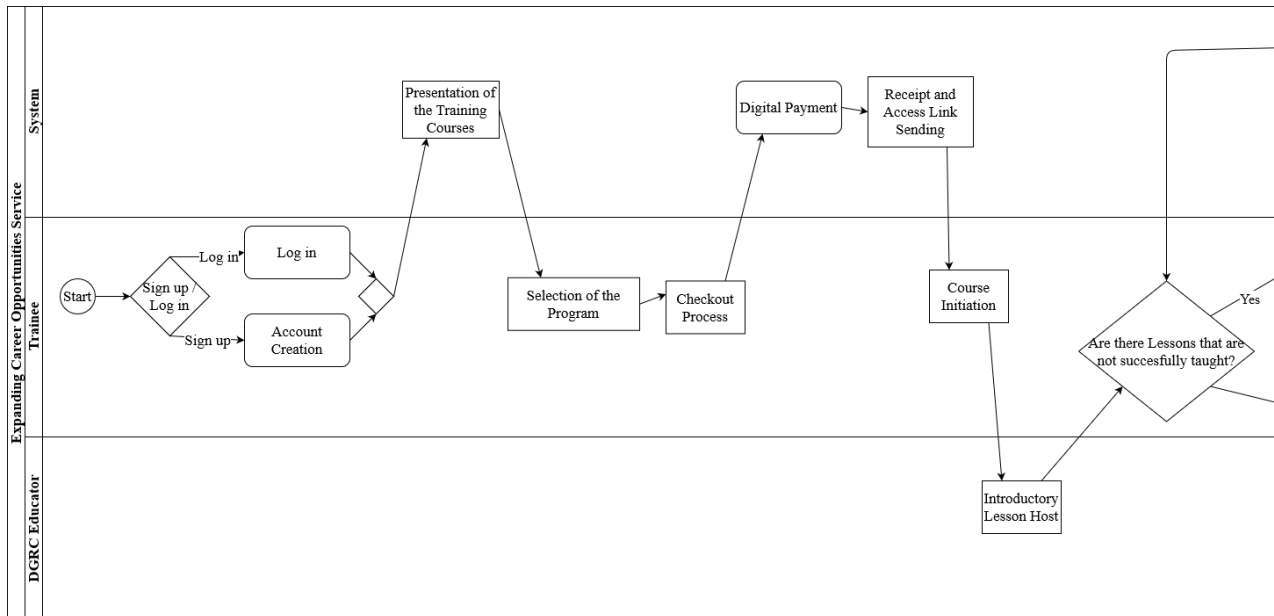
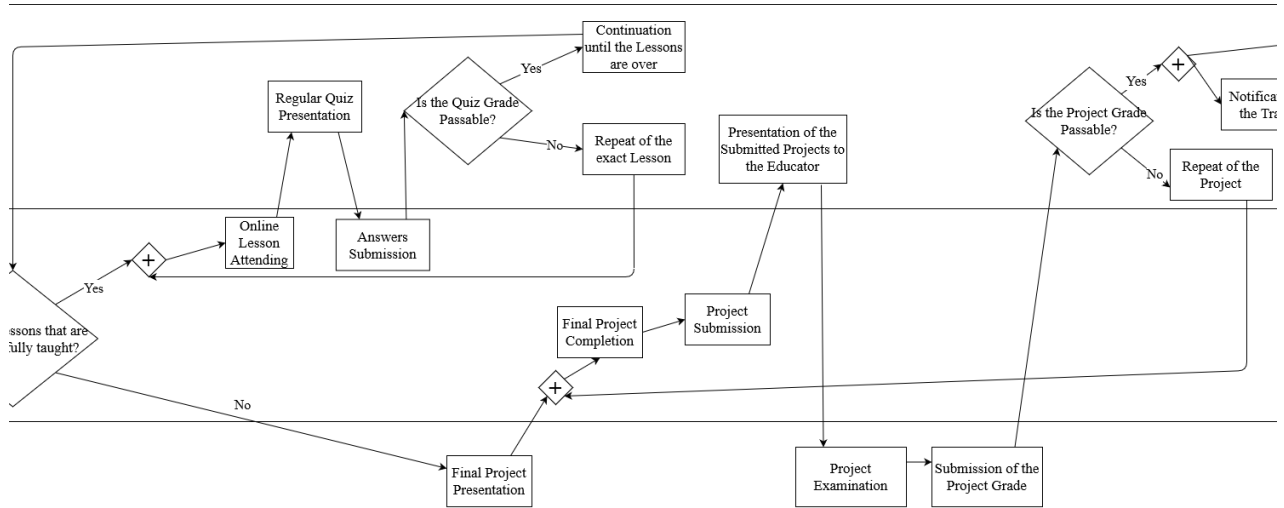
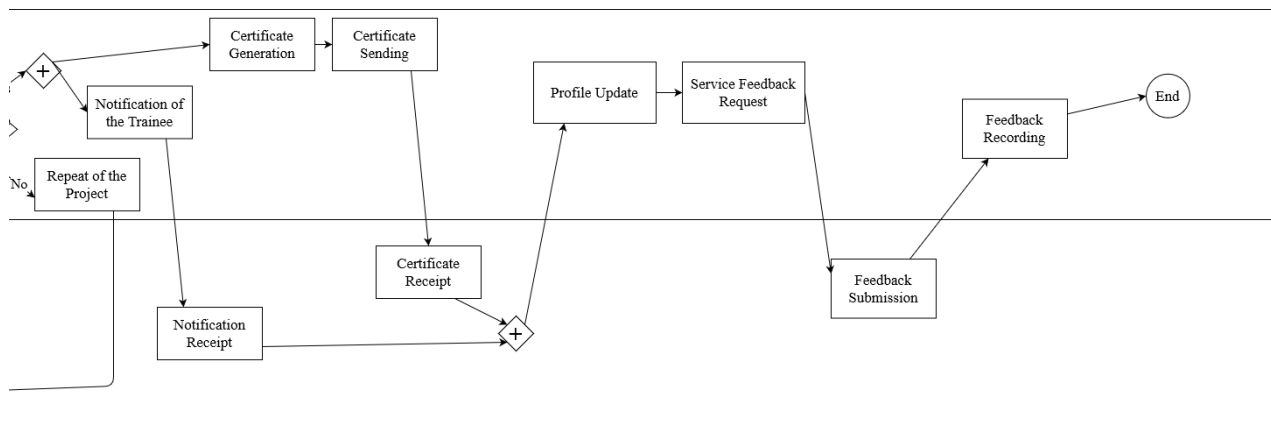


Figure 5. Training - Teaching Service (1/3)

**Figure 7. Training - Teaching Service (2/3)****Figure 6. Training - Teaching Service (3/3)**

It is important to clarify that this model depicts the process regarding the online course operation and attending and not the individual training events organized by the CoE. That is due to the fact that the events' structure pertains on the context of the organization and do not always follow the same format, while the training courses are more standardized. Additionally, the online courses are contributing to the financial feasibility of the CoE in larger part compared to the training events.

4.3.2.8 Revenue Model

This section includes the revenue model for the Training – Teaching Service for the first three years. The next table represents the revenue model for the first year.

Table 11. Training - Teaching Service Revenue Model (1st Year)

Revenue Type	1st Year						
	Price (in €)	Clients			Revenue (in €)		
		Base Case	Moderate Case	Optimal Case	Base Case	Moderate Case	Optimal Case
Regular Course Subscriptions	300	12	15	20	3600	4500	6000
Affiliated Course Subscriptions	280	15	18	24	4200	5040	6720
Total		27	33	44	7800	9540	12720

The next table represents the revenue model for the second year.

Table 12. Training - Teaching Service Revenue Model (2nd Year)

Revenue Type	2nd Year						
	Price (in €)	Clients			Revenue (in €)		
		Base Case	Moderate Case	Optimal Case	Base Case	Moderate Case	Optimal Case
Regular Course Subscriptions	300	12	16	22	3600	4800	6600
Affiliated Course Subscriptions	280	15	18	24	4200	5040	6720
Total		27	34	46	7800	9840	13320

The next table represents the revenue model for the third year.

Table 13. Training - Teaching Service Revenue Model (3rd Year)

Revenue Type	3rd Year						
	Price (in €)	Clients			Revenue (in €)		
		Base Case	Moderate Case	Optimal Case	Base Case	Moderate Case	Optimal Case
Regular Course Subscriptions	300	10	15	20	3000	4500	6000

Affiliated Course Subscriptions	280	12	15	18	3360	4200	5040
Total		22	30	39	6360	8700	11040

Once again, the revenue model can present certain elements for the service. In this case, the service it is reasonable to assume that the number of users that are subscribing to take the course is reducing during the years, since the marketing initiatives will decrease and the course will be less up-to-date, unless it is renewed.

4.3.2.9 Cost Model

This section presents the cost model of the Training – Teaching service. This model corresponds for the costs for one course from the time that it is designed to its conduction with real trainees, in the time period of three months. In this service, the CoE members involved are all the possible ones. The Faculty Member, who is coordinating the research and formation of the course and presents it to the trainees, is employed for two work days per week for the first month, where the course is structured, and for one day per week for the next two months, presenting it to the trainees and coordinating its projects. In this process, the Researcher is assisting, mainly in conducting research and generating the course material in the first month, where he or she is employed for three work days per week, and one work day per week for the rest of the two months, assessing projects and answering questions related to the course material. The Technical Staff Member is employed regularly, one day per week for the whole process, and the Administrative Staff Member is working according to the needs of the Faculty Member. The External Expert is visiting for one work day to provide a presentation for the trainees, which is relevant with the course thematic area and the educational objectives.

Table 14. Training - Teaching Service Cost Model

Cost Type – Stipends	Units – Working Days	Cost per Unit (in €)	Beneficiary Total Costs (in €)
Faculty Member	16	197	3152
Researcher	20	164	3280
Technical Staff	12	122	1464
Administrative Staff	16	93	1488
External Expert	1	164	164
Total	65		9548

Once again, the costs can be covered by the projected revenue.

4.3.2.10 Risk Analysis

This chapter includes the Risk Analysis for the Training – Teaching Service. It includes a Risk Matrix and a Risk Analysis Table. The next figure provides the Risk Matrix.

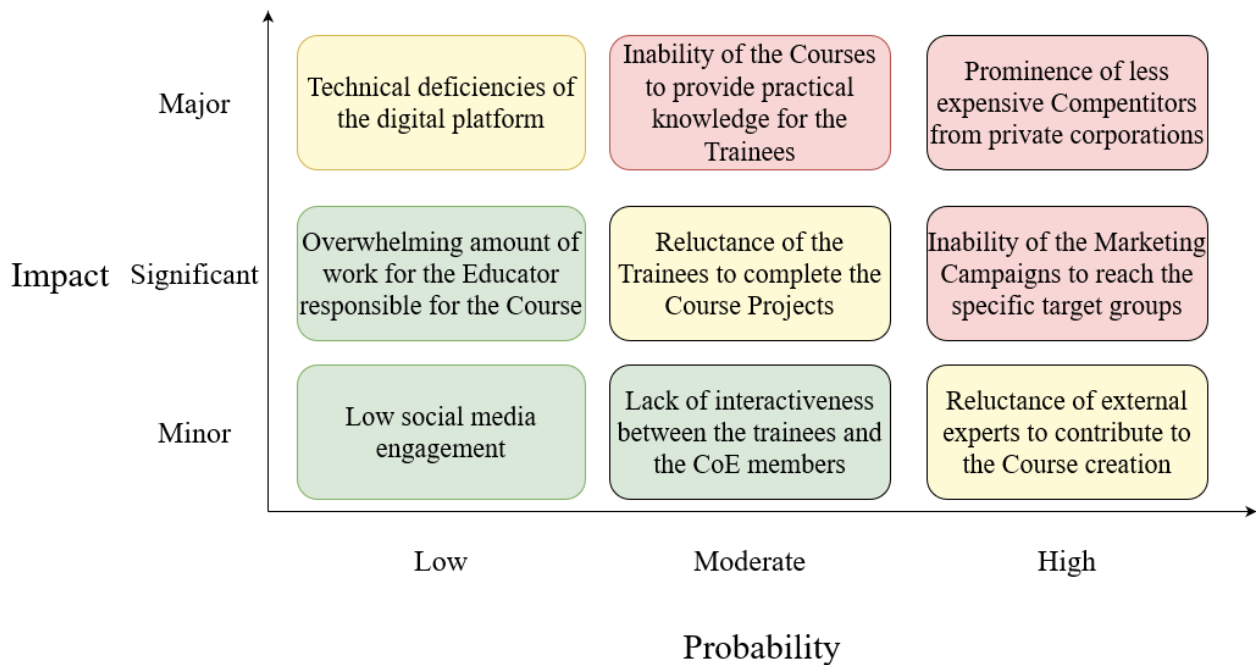


Figure 8. Training – Teaching Service Risk Matrix

The next table presents the Risk Analysis of the Service.

Table 15. Training - Teaching Service Risk Analysis

Risk Title	Probability	Impact	Prevention Plan
Prominence of less expensive Competitors from private corporations	High: Since the market of online training courses is rising, with increasingly more platforms ushering the market, it is logical to assume that plenty of them are going to provide competitive courses in aspects pertaining to digital governance.	Major: If the courses are not welcomed in the market and the users, the feasibility of the service is threatened. That is due to the fact that a course requires significant workload to be implemented.	Strong emphasis of the academic excellence of the course educators as well as the certification that will be awarded to the trainees after the completion of the course.
Inability of the Marketing Campaigns	High: With the current market being overloaded with	Significant: Social media and online platforms are integral	Outsourcing the digital marketing campaign to an

to reach the specific target groups	advertisement campaigns of training course platforms, standing out presents a real difficulty.	part of the young people's and students' information about the current market developments and opportunities. As a result, not being able to utilize these means could result to limited trainees choosing to take the courses.	external and specialized company is a suitable solution, since the well-functioning of the service requires frequent market campaigns.
Inability of the Courses to provide practical knowledge for the Trainees	Moderate: Digital governance subjects may be considered niche areas, since most practitioners usually start by acquiring knowledge relevant to programming or analysis.	Major: The trainees may decide to participate in another, more practical, course in order to expand their chances of finding employment in a non-niche area.	Careful design of the project, that provides real examples, applicable techniques and market-oriented skills development projects.
Reluctance of the Trainees to complete the Course Projects	Moderate: The trainees may be students or already working professionals, so it is fairly possible that their time will be limited.	Significant: The CoE needs to provide high-quality courses and if the trainees do not dedicate any effort in practicing their knowledge in the course subject, then the course will lose its reputation.	The only solution is to implement stern criteria on who will be awarded with the certificates and make no exceptions.
Reluctance of external experts to contribute to the Course creation	High: Since the experts are collaborating in the CoE in a number of services and operations, dedicating the time to create course sessions would be demanding for them.	Minor: There are plenty of experts in the market and even if none of them are willing to participate, the CoE Faculty Members are capable of providing the knowledge relevant	Providing incentives for the experts to collaborate, such as revenue dividends or discounts in other CoE services, could be proven advantageous.

		with the course subject.	
Technical deficiencies of the digital platform	Low: The service does not require significantly complex platform functions.	Major: In the unlikely event that the platform does not perform properly the progress, the certification and even the payment information of the trainees are at stake.	Outsourcing a regular technical and security assessment of the CoE's platform would be a prudent solution.
Lack of interactiveness between the trainees and the CoE members	Moderate: Since the course has the objective of transferring knowledge, which is plentiful in the digital governance ecosystem, the course may focus on the knowledge transfer in a disproportionate level in comparison to its interactiveness	Minor: Even if the interactive element of the course is present in lesser extent, the course can still be interesting and advantageous towards the career of the trainee.	Incorporating non formal education activities, graphical interfaces and gamification procedures are good solutions in order to increase interactiveness in the course.
Overwhelming amount of work for the Educator responsible for the Course	Low: Since the course needs a Faculty Member to coordinate its conduction and to exam the trainees' knowledge through the projects, it is reasonable to assume that this will trammel the educator's academic duties.	Significant: The less academically active the Faculty Member is the less up-to-date the information regarding the course will be and the less prominent the research output of the CoE will be.	Assigning teaching assistants for the courses is a good solution, in order for to help the educator.
Low social media engagement	Low: Since the main target group of the course is young professionals, students and professionals who are	Minor: Even if the interaction is low, the digital advertisement techniques can still operate in order for	Regular, interactive social media posts, like quizzes, giveaways and feedback forms are easy ways of keeping

	already familiar with the digital area and need to expand their skills, they are all familiar with social media and thus the interaction is expected to be notable.	the CoE to reach out to the target group.	the engagement in high levels.
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4.3.3 Consulting

4.3.3.1 Overview

The consulting service is an integral part of the CoEs that scientifically deal with fields closely related to market applications, since the CoEs expand the knowledge base on the basis of the research and the theoretical aspects of what the market is implementing. Fundamentally, it may be considered the service that provides in depth information in the market stakeholders, companies and public organizations, while also assessing their work methodologies, infrastructure and tools utilized.

The involved parties are selecting from a range of alternative consulting service categories, based on their needs, their organization type, their services and products, their technical and organizational structures and processes implemented and other factors. Due to the variance of the organizations' needs in terms of the elements examined and the knowledge exchanged, the exact structure of the consulting service could be described as ad hoc, to an extent. However, there is expected to be a robustly determined prototype of service forms, regarding which aspects are examined based on the type of the organization and its structure, or what technological means are to be assessed and based on what standards. In essence, there is expected to be a set of already determined methods, tools and assessment procedures to be utilized and combined in the exact orientation that will be decided in consultation with the organization that requires consulting from the CoE.

The service can be priced based on the needs of each organization that seeks consulting. Some may request short sessions for specific aspects of their business operation, while others may request frequent collaboration for some or all of their projects. It is fairly possible that some of the organizations may wish to achieve a higher level of digital readiness and thus will seek assistance in re-engineering their business processes and improving their infrastructure. In accordance to the structure of the service, the pricing will be customized for the needs of the organization, with some fundamental models already defined.

4.3.3.2 *The Need*

Recent literature studies suggest that virtualization and digitalization are directions that provide multiple benefits, such as efficiency and innovative services and business models provision, for the consulting process (Nissen, 2017). Consequently, with a total market value of at least \$250 billion (Consultancy.uk, 2017), it is safe to assume that the future of this large market should be carefully strategized in a digitally enabled manner in order to provide the best outcome that will affect such a great number of market stakeholders.

Aside from the general consulting services, which are apparently enhanced by the digitalization, there are specific sectors of the market where consultancy flourishes. Namely, the government consulting sector is a market segment that includes at least 90 companies worldwide (Consultancy.org, 2022). With such a wide range of companies it is reasonable to assume that this sector has a conceivable potential in terms of the projects generated and the government institutions that request consultancy.

Since the government institutions, especially the local government institutions, are increasingly experimenting with new innovative projects that are based on prominent disruptive technologies, such as artificial intelligence and disruptive ledger systems, that transform the public services and the policy making process (Barcevičius et al., 2019), the sector of digital governance is put in the foreground. It is also commonly mentioned in literature that it is important to formulate multidisciplinary teams for projects that pertain to areas related to digital governance, such as open data, where some of the experts provide external consulting services (Sandoval-Almazán et al., 2017).

Ultimately, it is apparent that the consulting market is large and increasing, with its government sector being reasonably broad. It is also apparent that the government institutions are progressively experimenting with digital governance initiatives, whose success is considered to be influenced by the multidisciplinary nature of the teams. Those indications could imply that the consulting for digital governance is a productive market area and a highly sought-after one. With the academic institutions being reported to be increasingly involved in the consulting process (Fudickar, Hottenrott and Lawson, 2018), it is reasonable to assume that digital governance projects and the organizations that host and coordinate them have need of the consultancy of academic CoEs.

This direction can be particularly suitable for the Greek public ecosystem. In the effort to digitalize its public ecosystem, Greece could welcome the interaction between the HER institutions and the industry, implementing the research outcome of the institutions for the benefit of the country (Katsikas and Gritzalis, 2017). And the fact that some of the Greek digital government academic community scholars hold high positions in relevant academic rankings (Scholl, 2020) is auspicious for the capacity of the Greek HER institutions.

4.3.3.3 *Aims and Objectives*

The aim of this service is to deliver the expertise emerged from the research activities, projects and publications to the market, the public organizations, the non-governmental organizations and the other HER institutions that wish to become more digitally enabled. The expertise is provided

through consulting sessions and deliverables that reflect the needs and the goals of each applicant organization and each project.

The service is an effort of the CoE to answer to the demand of the market for counseling regarding the best practices in digital transformation, open government, business process re-engineering, digital infrastructure efficiency and overall research and analysis of feasibility. The CoE's goal is not to create a platform where the external organizations can just find information about the consulting service, book a set of sessions and then utilize the consultancy for their organization and their projects. The goal is to create a network of collaborating companies and organizations, who will frequently seek the CoE's consultancy for their organization and their various projects, participate in the rest of the CoE's services and activities, such as events organization, training activities and supporting career opportunities, and finally conduct research projects and research studies in collaboration with the CoE. Of course, requesting consulting service does not imply that the company or the network should be a partner, and thus the service is completely open for companies that contact the CoE for the first time and they are not obliged to continue the collaboration after the service completion.

The objective is for the service to be provided in a hybrid format. This not only increases the efficiency of the CoE's work and reduces certain costs, but it also establishes the digital element to the process by enabling the organization representatives to outline their needs themselves, customizing the standardized packages provided and keeping record of the initial customer needs, enhancing the transparency of the service. For this reason, the responsible CoE members will define some initial consulting service packages that can be categorized based on what organization or project aspect they examine (i.e., digital transformation, business process re-engineering, business intelligence). Each package includes a number of assessment procedures that need to be followed, the relevant training material, access to tools necessary for the consulting service as well as deliverables that will be granted to the organization after the service conduction. Essentially, these deliverables include the results of the consulting process, a plan to be implemented in the near future by the organization in order to improve towards the selected topic, as well as documentation for any technical implementation that is required. Additionally, the CoE will offer the conditions under which it may assist the organization in its future steps and arrange a collaboration.

This service is a unique opportunity for the CoE to both implement its research results and thus to gain practical insights over them, which in turn will provide it with better orientation for the future research initiatives, but also to generate a considerable revenue stream. The consulting may be the most highly priced service provided by the CoE, since its scope of application is frequently the corporate environment and projects found in the industry. As a result, the customers expect exploratory function and detailed solutions provided in the end, which require continuous evaluation, assessment, planning and suggestions from the most experienced members of the CoE and its outside partners. These members, usually faculty members, senior researchers, external experts and companies require a higher stipend, and thus the pricing will be relevant.

4.3.3.4 Target Users

The service is supposed to be open for every company, public organization, non-governmental organization and HER institution that wishes to become more digitally enabled or is involved in a

project that requires expertise in the digital governance area. Yet, even if the categories of the organizations that are potential clients vary, the plethora of the service subcategories can be requested by all of them. For instance, the service category of digital transformation, or the business process re-engineering can be of use for any organization, regardless of its aim, its structure or its articles of association. On the other hand, there are some service instances that may be considered inapplicable for certain organization types. For example, the e-procurement consulting service may be useful for some public organizations, but it would not be significantly useful for some non-governmental organizations. This is the reasoning behind providing several packages of consulting services, so the organizations can choose the one more suitable for their goals.

The CoE's role is firstly to receive the application submitted through the digital platform, where the representative of the organization will state the exact service packages that his or her company wishes to employ, with the potential of customizing some of them. After that, the CoE members responsible for the corresponding service packages coordinate the preliminary research over the demands of the client. After that, the CoE members organize a meeting with the client and the consulting process begins. During the agreed time period there may be several meetings with the client, training sessions with selected group of employees, assessment of the programs, tools, procedures and work methods inside the organization as well as interviews with some users and clients of the organization. The consulting service may also include development of a specific program, model or report concerning the organization's work that is considered advantageous towards its functioning during and after the consulting service.

4.3.3.5 Dissemination Level

The dissemination strategy is planned to be implemented on the basis of notifying the public organizations, companies, non-governmental organizations and HER institutions with which the CoE faculty members have already collaborated at some point in their career, for instance for a past research project. As a result, the prospective collaborating parties shall come mainly from Greece, since the CoE will not have the testimonials to be attractive beyond borders. Once the service becomes more established, the foreign companies and organizations will be more confident in trusting that the CoE and its members have a deep understanding of the field of digital governance, not merely its Greek section, and thus they will collaborate with the CoE.

This particular service is quite demanding on its marketing expenses. Since it is meant to provide consulting services, the opportunities for a company or an organization wanting to benefit from the CoE's expertise are multiple, especially considering that the digital element of the field of expertise can make the consulting ever more relevant at the current market. However, there is a solid set of competitors already in the market and in order for the target group to be reached the marketing campaign should be continuous. This makes social media a good starting point, since they provide personalized advertisements that could reach the stakeholders and promote the service. Another form of promotion is the media coverage, meaning newspaper and magazine articles, online content creation platforms sponsorships and video advertisements. This is a more interactive form that could lead to a wider dissemination of the service. Finally, there is space for affiliate links, which can be utilized by an organization or a company that will promote this service to its clients or partners in order for them to consider the service for their organizations. This will give the first organization or

company the ability to receive a small portion of the revenue that the CoE benefits if its partner organization chooses to employ the consulting service, based on the pricing.

4.3.3.6 Technical Specifications

The digital platform is the first impression that the representative of the company or the organization will have with the CoE and its services. The consulting service categories are collectively presented in a separate page. For each one of them there should be information, objectives, types of organizations that this service targets as well as approximate pricing for the service. The prospective clients should browse this page and inform themselves over the service type they require as well as the customized elements they might request, since one request can include elements from several service packages.

After the prospective client is informed about the service and its variations, the next step is the filling of the online form that corresponds to the request concerning the service specifications. This is a separate web page, precisely a form, that includes the fundamental information necessary for the CoE members to understand the request. The form includes is separated in parts. The first part includes information about the organization, such as its type, the number of its employees, its line of work, its basic products and services, its goals for the upcoming years and other fields. This will give the CoE members the outline of the organization. The second part includes information about the area in which the organization requests consulting. In this step the representative should insert the exact consulting type they require, meaning the subcategory of the service, the reason they require it, for example in order to open up to a new market or to successfully complete a project as well as the expected results, meaning the expected the activities, such as training, infrastructure assessment. At this point, the representative can customize the consulting package adding other packages' activities, retrieved from a list, in order to better accomplish the best depiction of the needs of the organization. Finally, the last part includes the logistics of the consulting. Instances of the information types requested in this part are the number and the type of the meetings (virtual or physical), the number and the type of the assessments that will take place, the level of the organization employees that will participate in the consulting, the potential participation in a common project in the context of the consulting process as well as the form of the deliverables finally received by the organization from the CoE after the completion of the consulting service. The information is inserted either in texts, lists and metric inputs, depending on the type of the information. Additionally, the representative inserts the contact information about the organization in order for the CoE to later get in touch with them.

The platform notifies the responsible CoE members and they coordinate the initiation of the preliminary research, after they contact the organization and confirm the submission and set an initial timeline. The platform plays a minor role in the continuation of the service. The two parties coordinate the consulting process through email and meetings.

4.3.3.7 Main Process

The next figures present the main process of the Consulting service. The main participant is the Organization, which seeks consultancy, and the Coordinator of the Consulting in the specific area requested and who is a DGRC Member, usually a Faculty Member.

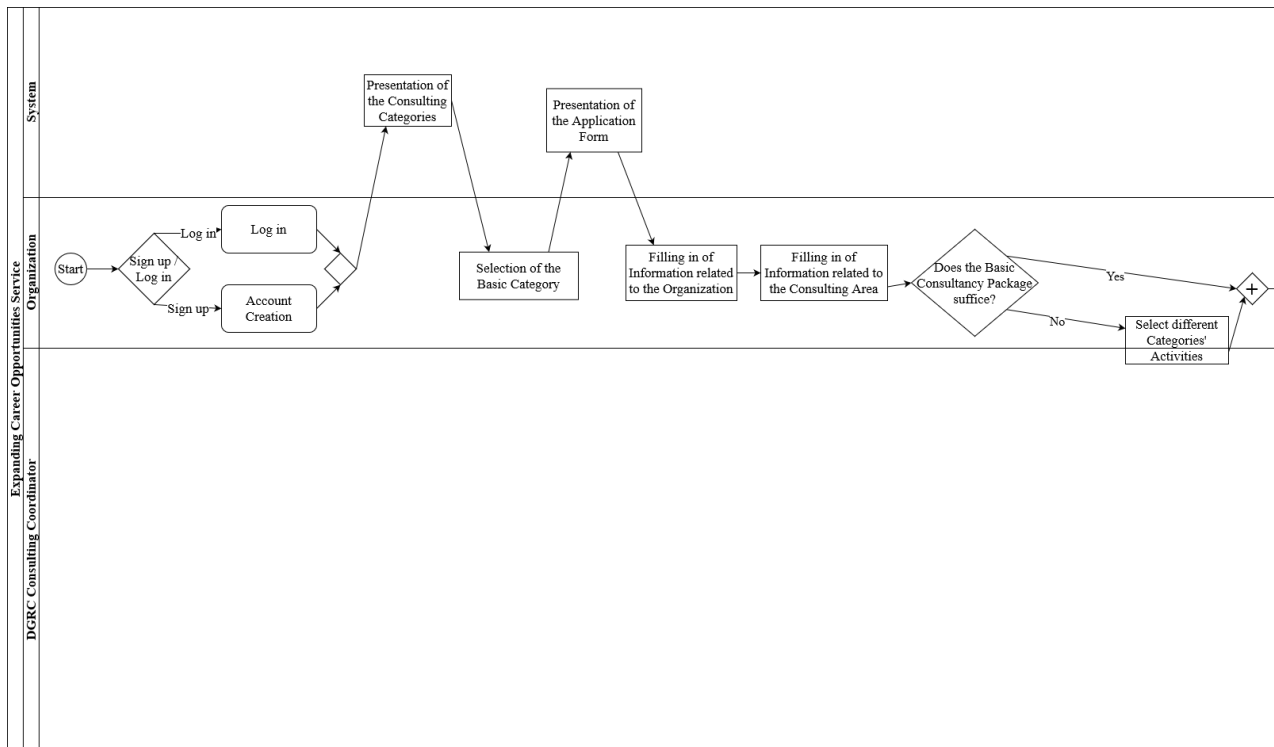


Figure 9. Consulting Service (1/3)

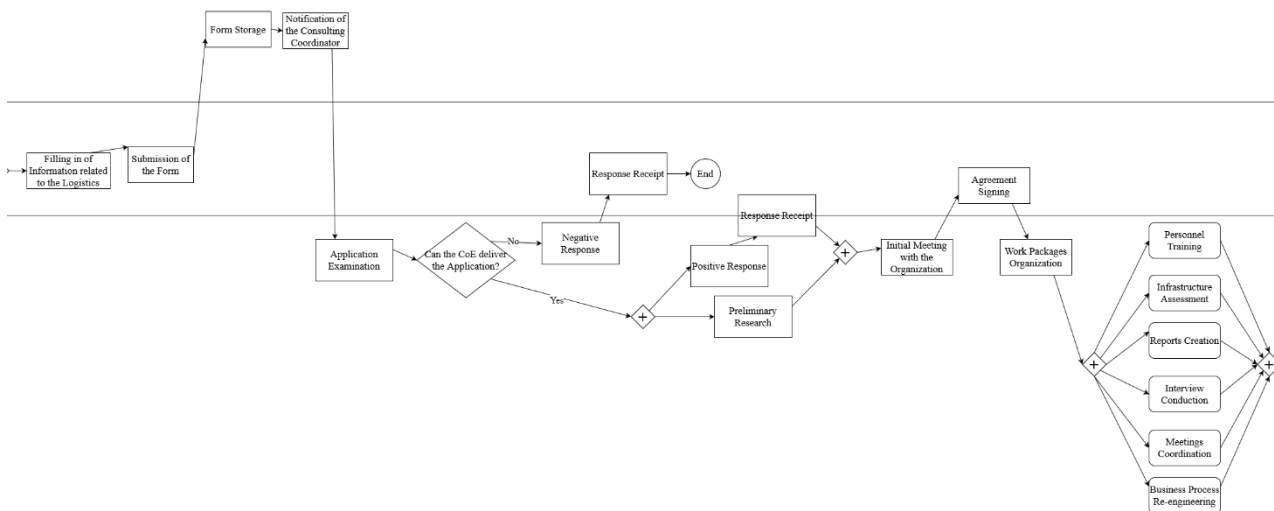


Figure 10. Consulting Service (2/3)

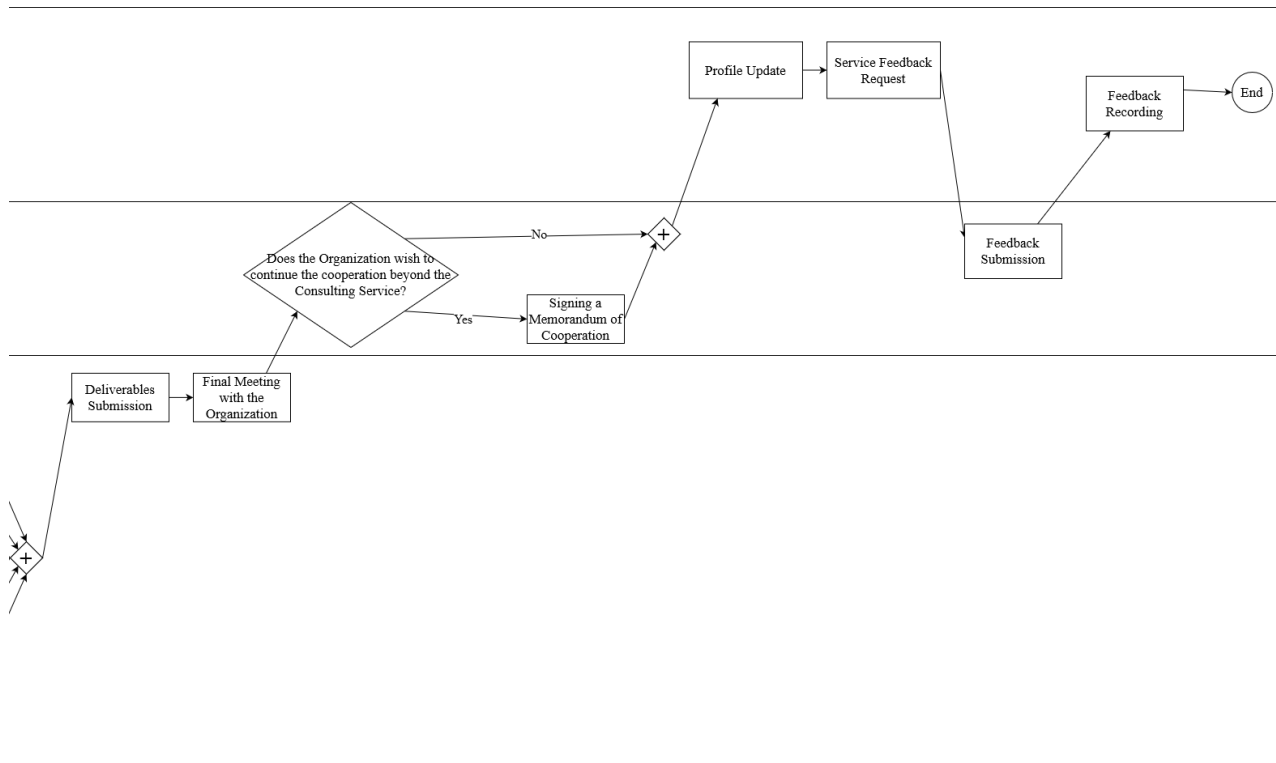


Figure 11. Consulting Service (3/3)

In the process presented in the previous figures the actual processes of the CoE activities conducted during the consulting process are not thoroughly presented. That is due to the fact that these processes vary depending on the type of the consulting area, the organization requesting consultancy and the available budget. The pricing and payment methods are also not included, since these are also depended on the organization type and the pricing of the consulting service customized for the situation.

4.3.3.8 Revenue Model

This section provides the revenue model of the Consulting service. The next table presents the revenue model of the first year.

Table 16. Consulting Service Revenue Model (1st Year)

Revenue Type		1st Year						
		Price (in €)	Clients			Revenue (in €)		
			Base Case	Moderate Case	Optimal Case	Base Case	Moderate Case	Optimal Case
Regular Consulting Service	Personnel Training	900	2	5	8	1800	4500	7200
	Infrastructure Assessment	1200	4	8	10	4800	9600	12000
	Reports Creation	400	4	8	10	1600	3200	4000

	Clients Interview	800	2	5	8	1600	4000	6400
	Business Process Re-Engineering	1000	4	8	10	4000	8000	10000
Collaborating Companies Consulting Service	Personnel Training	800	3	5	8	2400	4000	6400
	Infrastructure Assessment	1100	5	10	12	5500	11000	13200
	Reports Creation	200	5	10	12	1000	2000	2400
	Clients Interview	700	2	5	8	1400	3500	5600
	Business Process Re-Engineering	800	5	10	12	4000	8000	9600
Affiliated Marketing Companies Consulting Service	Personnel Training	850	2	5	8	1700	4250	6800
	Infrastructure Assessment	550	5	8	10	2750	4400	5500
	Reports Creation	350	5	8	10	1750	2800	3500
	Clients Interview	750	2	5	8	1500	3750	6000
	Business Process Re-Engineering	950	5	8	10	4750	7600	9500
Total			55	108	144	40550	80600	108100

The next table presents the revenue model of the second year.

Table 17. Consulting Service Revenue Model (2nd Year)

Revenue Type		2nd Year						
		Price (in €)	Clients			Revenue (in €)		
			Base Case	Moderate Case	Optimal Case	Base Case	Moderate Case	Optimal Case
	Personnel Training	900	3	6	10	2700	5400	9000

Regular Consulting Service	Infrastructure Assessment	1200	5	10	12	6000	12000	14400
	Reports Creation	400	5	10	12	2000	4000	4800
	Clients Interview	800	3	8	10	2400	6400	8000
	Business Process Re-Engineering	1000	5	10	12	5000	10000	12000
Collaborating Companies Consulting Service	Personnel Training	850	3	5	8	2550	4250	6800
	Infrastructure Assessment	550	5	10	12	2750	5500	6600
	Reports Creation	350	5	10	12	1750	3500	4200
	Clients Interview	750	2	5	8	1500	3750	6000
	Business Process Re-Engineering	950	5	10	12	4750	9500	11400
Affiliated Marketing Companies Consulting Service	Personnel Training	850	3	5	8	2550	4250	6800
	Infrastructure Assessment	550	5	8	10	2750	4400	5500
	Reports Creation	350	5	8	10	1750	2800	3500
	Clients Interview	750	3	5	8	2250	3750	6000
	Business Process Re-Engineering	950	5	8	10	4750	7600	9500
Total			62	118	154	45450	87100	114500

The next table presents the revenue model of the third year.

Table 18. Consulting Service Revenue Model (3rd Year)

Revenue Type	3rd Year		
		Clients	Revenue (in €)

		Price (in €)	Base Case	Moderate Case	Optimal Case	Base Case	Moderate Case	Optimal Case
Regular Consulting Service	Personnel Training	900	5	8	12	4500	7200	10800
	Infrastructure Assessment	1200	8	10	12	9600	12000	14400
	Reports Creation	400	8	10	12	3200	4000	4800
	Clients Interview	800	5	8	10	4000	6400	8000
	Business Process Re-Engineering	1000	8	10	12	8000	10000	12000
Collaborating Companies Consulting Service	Personnel Training	850	3	5	8	2550	4250	6800
	Infrastructure Assessment	550	5	10	12	2750	5500	6600
	Reports Creation	350	5	10	12	1750	3500	4200
	Clients Interview	750	2	5	8	1500	3750	6000
	Business Process Re-Engineering	950	5	10	12	4750	9500	11400
Affiliated Marketing Companies Consulting Service	Personnel Training	850	5	5	8	4250	4250	6800
	Infrastructure Assessment	550	8	8	10	4400	4400	5500
	Reports Creation	350	8	8	10	2800	2800	3500
	Clients Interview	750	5	5	8	3750	3750	6000
	Business Process Re-Engineering	950	8	8	10	7600	7600	9500
Total			88	120	156	65400	88900	116300

4.3.3.9 Cost Model

This section presents the cost model of the Consulting service. The CoE members employed are all the possible ones and they are employed for the scope of one month, until the consulting with the company or the organization is concluded. The Faculty Member is employed for one work day per week, coordinating the process. The Researcher is employed for two work days per week, implementing the research and reporting activities. The Technical Staff Member is employed for two work days per week, assessing the technical infrastructure of the organization or the company. The Administrative Staff Member is also employed for two work days per week, organizing and providing assistantship. Finally, the External Expert is called for one work day in order to provide expertise for the consulting process.

Table 19. Consulting Service Cost Model

Cost Type – Stipends	Units – Working Days	Cost per Unit (in €)	Beneficiary Total Costs (in €)
Faculty Member	4	197	788
Researcher	8	164	1312
Technical Staff	8	122	976
Administrative Staff	8	93	744
External Expert	1	164	164
Total	29		3984

It is visible that the cost model can be covered from the revenue streams.

4.3.3.10 Risk Analysis

This chapter includes the Risk Analysis for the Consulting Service. It includes a Risk Matrix and a Risk Analysis Table. The next figure provides the Risk Matrix.

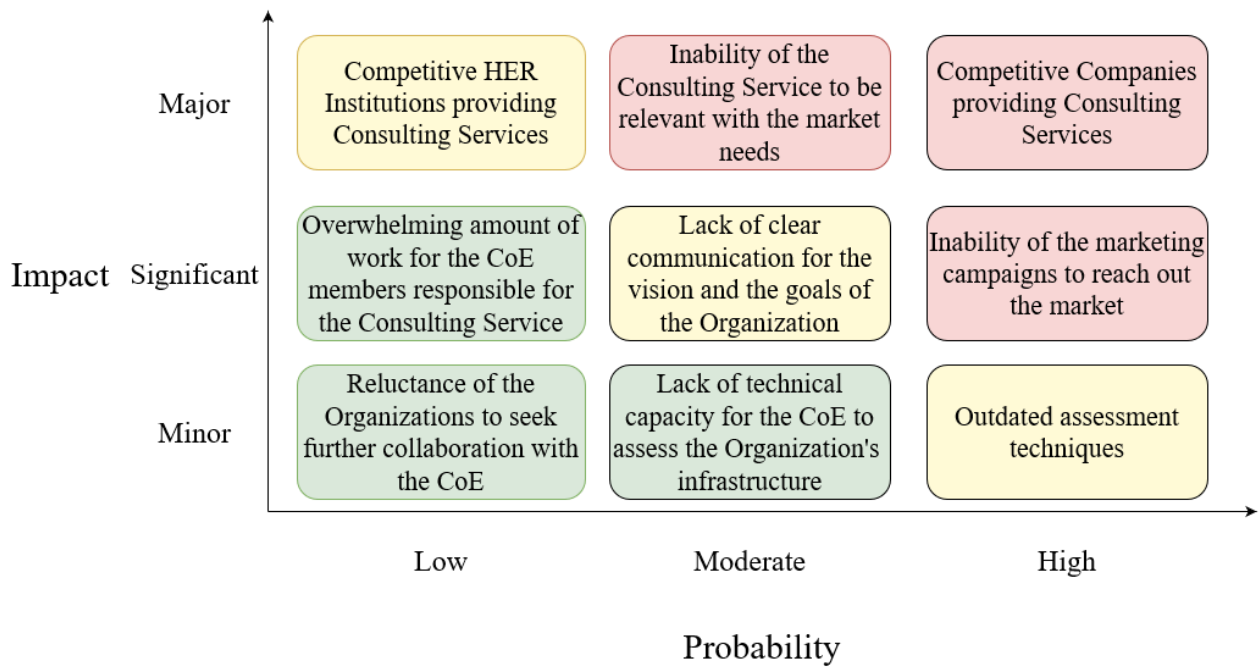


Figure 12. Consulting Service Risk Matrix

The next table presents the Risk Analysis of the Service.

Table 20. Consulting Service Risk Analysis

Risk Title	Probability	Impact	Prevention Plan
Competitive Companies providing Consulting Services	High: Since the market share of digital governance is rising, there is an increasing number of companies that are actively involved with the consulting service in this area.	Major: If the service is not welcomed in the market due to the existing competition, the fiscal feasibility of the service is threatened, in addition to the flaw in the CoE's reputation.	Strong emphasis of the marketing campaigns to the prevalent advantages of the CoE's service, such as academic excellence and innovative methods and practices.
Inability of the marketing campaigns to reach out the market	High: Since the companies and organizations that may need the specific consulting provided by the service are actively involved in the digital ecosystem they have access to a large number of online competitors,	Significant: Not being able to reach out to specific companies and organizations through the marketing campaigns, then the word-of-mouth dissemination of the service may not	Outsourcing of the marketing campaign to an experienced marketing and social media promotion company.

	advertisement campaigns and promotional offers on a regular basis, and as a result standing out from all the campaigns is challenging.	suffice for its fiscal feasibility.	
Inability of the Consulting Service to be relevant with the market needs	Moderate: Since the CoE is an academic entity, it is possible that the needs that the service cover may not correspond to the actual needs of the existing market's companies and organizations.	Major: If the service does not answer the actual market's needs, but rather an academic perspective of the market's needs, then the service will not be welcomed by the market.	Conducting interviews with a diverse group of market stakeholders before the decision of the consulting areas and the exact form of the consulting in order to identify the market needs is a potential solution.
Lack of clear communication for the vision and the goals of the Organization	Moderate: Since the consulting sessions cannot be conducted in overly long working hours, it is possible that the outcome of the sessions will not be communicated with the proper exactitude.	Significant: If the vision and the goals of the service conduction are not clearly stated in detail, the outcome may differ from the client's expectations and that will lead to unsatisfaction.	The usage of formally defined questionnaires in order to extract all the necessary information, the checking of the answers from the clients as well as regular feedback from them during the process is a set of prudent solutions.
Outdated assessment techniques	High: It is fairly possible that the companies and organizations that are actively involved with the digital market are using complicated systems, that cannot be assessed effectively with the	Minor: Some metrics may not be accurate and the reports and consulting deliverables may fall short on the quantitative results they would otherwise present.	A potential solution would be preliminary research over the structure of the company or organization in order to prepare the appropriate assessment methods.

	existing assessment methods and techniques that the CoE utilizes.		
Competitive HER Institutions providing Consulting Services	Low: There are not numerous academic institutions both relevant to the digital governance market and capable in constructing consulting services.	Major: The current market does not have enough space for numerous HER institutions' consulting services in the area of digital governance. As a result, if a HER institution is participating in enough projects, then it creates a strong network of collaborating companies and will not accept different HER institutions.	Since it is rare to combine both the academic excellence and the market experience in digital governance for a CoE, it would be advantageous to emphasize the dual nature of the experience of the CoE in the marketing campaign to prevail amongst the other HER institutions.
Lack of technical capacity for the CoE to assess the Organization's infrastructure	Moderate: It is fairly possible that the technical infrastructure of the CoE does not suffice in order to assess the technical infrastructure of the organizations, since they may be using cutting-edge platforms.	Minor: It is not significantly problematic to not possess every tool used for assessing all the active systems in the market, since the variety is overwhelming, but it may slow the processes, until the appropriate tools are found.	If the tools are hard to acquire, outsourcing specific parts of the assessment to external boutique companies.
Overwhelming amount of work for the CoE members responsible for the Consulting Service	Low: Since the CoE members that will be employed during the consulting process are members of the academic community surrounding the CoE,	Significant: Disproportionate working hours for the CoE members may lead to fewer hours for the members to research and study	Employment of less experienced members as well, at least for the less demanding tasks, in order to

	the workload may distract them from their academic duties.	new techniques in the digital governance area, which will limit the services' innovation.	assign them more equally.
Reluctance of the Organizations to seek further collaboration with the CoE	Low: The value proposition of the service is not only fiscal, but also the creation of a network of collaborators. And since the CoE will satisfy their needs, it is likely to seek collaboration with them in other future endeavors.	Minor: Even if the network of collaborating companies and organizations is not expanded with the addition one specific company, the CoE members can provide an active network to the CoE from their research projects coordination.	Provision of discounts for future consulting service for the companies that agree to be a member of the network of collaborators.

4.4 Digital Governance Research Centre Service Creation

The service created could be presented through an exemplary training course that simulates the main subject of the service provided to the users. The training course is designed to be provided online, as a set of slides that are presented by a course instructor, a set of in-course questions that the trainees should answer and a final project that is assigned to the trainees for them to be able to qualify for the certification.

The training course subject is relevant with the thematic area of the CoE that provides it, either directly or through an affiliated University's Lifelong Learning Center. In this case, the training course is provided on the subject of Digital Governance and Digital Transformation. This particular course is only one of the several training courses that could be included to the curriculum of the CoE, with subjects like Interoperability, Open Data, Digital Innovation and Entrepreneurship also being potential subjects.

The training course is designed taking into consideration the needs of the prospective trainees, who are the public officials that seek to deepen their knowledge of the digital developments pertained to their work environments, the market stakeholders who wish to explore the possibilities of the Digital Governance and Digital Transformation for the benefit of their companies as well as the young researchers and students that are willing to combine the digital studies with their own education in order to come up with novel ideas and suggestions for the benefit of their careers and

the relevant research fields. As a result, the course is not solely technologically nor organizationally focused, and it does not present the educational content solely by the academic nor the industrial point of view, in order to provide a holistic approach towards Digital Governance and Digital Transformation.

4.4.1 Content Creation

The content of the training course can be interpreted as a mean for the trainees to get a grasp on the fundamentals of Digital Governance and Digital Transformation. Essentially, this course is an introductory course for someone who is not familiar with the notions of this academic area and wishes to usher themselves into it, without having significant technical expertise. The next paragraphs present the exact modules of the training course and their educational scope and objectives.

The first, and introductory module is called “Digital Governance” and is essentially the first presentation which the trainees should be exposed to, in order to set the foundation of their understanding of the field. In this module the trainees are expected to get familiar with terms like the definition of Digital Governance, the three generations of Digital Government and their points of interest, the four types of services provided in the Digital Governance, the different approaches of service provision and their pros and cons as well as the basic assessment methods of Digital Governance services.

The second module is called “Digital Governance: The Foundation and the Scientific Base”. This module provides a more academically focused explanation of the Digital Governance, as a research area, as well as the more detailed notions corresponding to the scientific foundations of Digital Governance. In this module the trainees are expected to be exposed to subjects like the Digital Governance Science Base, its domain structure and all of the corresponding components, its neighboring domains, its research roadmap, its training curricula, its methods and assessment tools, its problem space, its solution space, its solution methods and tools as well as some prominent examples of solution metrics.

The third module is called “Digital Governance and Policy Making: Opportunities and Challenges” and it provides a policy-making approach on the Digital Governance. It presents the reasoning behind the study of the Digital Governance related policy making process, the timetable of the Digital Government generations and its interrelation with the industrial revolutions, the challenges and the opportunities of the Digital Governance policy making process.

The fourth module is called “Digital Transformation: Principles and Strategic Objectives” and is one of the most important modules of the course. Its goal is to expose the value of Digital Transformation, as a set of practices and development direction. It presents aspects like the definition of Digital Transformation as well as its basic principles, its strategic goals, its prerequisites, its basic governance model, its basic project development model as well as some basic dynamic tools used during the projects’ implementation.

The fifth module is called “Research and Actions for Digital Transformation”. It provides a more practical approach towards Digital Transformation. It presents the status quo of the Digital Governance and Digital Transformation, the relevant community, some implementation models of

Digital Transformation, the five goals for better governance as well as some actions relevant to the axes of Digital Transformation.

The sixth module is called “Open Government” and it aspires to provide the basic outline of this field. It presents the definition of Open Government, the description of the open approach, some benefits and drawbacks of this approach, some indicative functions of Open Government, the current international policies, the creation cycle of the Open Government as well as some prominent tools and systems.

The seventh module is called “Big, Open and Linked Data”. Its main goal is to provide information about Big Data, Open Data and Linked Data and their interrelations. It presents the terms of Big Data, the “3+3 Vs” of Big Data, the Big Data challenges, the Open Data, the “5 Star Data” model, the Open Government Data and their lifecycle, the Linked Data and the four rules of Linked Data.

The eighth module is called “Artificial Intelligence and Digital Governance”. It includes the status quo of applications of Artificial Intelligence in Digital Governance and their future. It presents the Artificial Intelligence definition, its role in Digital Governance, the five levels of automation of services in Digital Governance, the three axes of development of technology in Digital Governance, the most prominent case studies of Artificial Intelligence in Digital Governance, the future of the Artificial Intelligence as well as some of the examples of Artificial Intelligence in various sectors of the economy and the society.

The ninth module is called “Smart Cities” and it provides some fundamental characteristics of Smart Cities in the context of Digital Governance. It presents the definition of Smart Cities, the roles inside Smart Cities, the sectors of interest in Smart Cities, the four generations of Smart Cities, the notion of Digital Participation, the role of Disruptive Technologies in Smart Cities, some Innovation Factors of Smart Cities, the trends and directions of Smart Cities as well as some relevant standards and assessment metrics.

The tenth piece of the educational material of the training course refers to the Final Project of the course. It is a detailed assignment that the trainees should successfully deliver in order to be eligible for the training course certification. It includes four open-ended, comprehensive questions in various subjects discussed during the training course.

It is important to clarify that this project is not the only way of assessing the trainees understanding of the training course’s input. The trainees are subject to regular quizzes and questions during each module. The course questions are usually closed-ended, including true/false questions, matching questions, multiple choice questions as well as some text comprehension questions. The trainees should answer these questions correctly in order for them to be eligible and also to get a better grasp of the subject of each module.

4.4.2 Design

The design choices of the training course are relevant with the form of presenting the information. Since it is a set of presentations (modules), the design is expected to be interactive in order to keep the attention of the trainee and to inspire him or her to actively participate in the course. For that

reason, there were some particular design directions that were followed in the creation of the modules.

Firstly, the information slides' form varies, in order to emphasize the information presented and to keep the attention of the trainee.

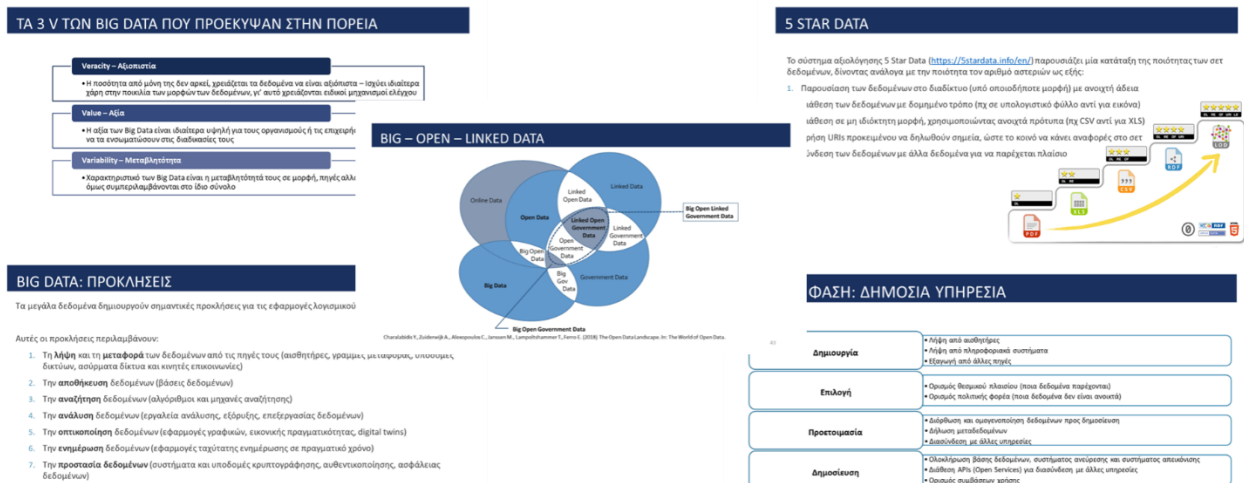
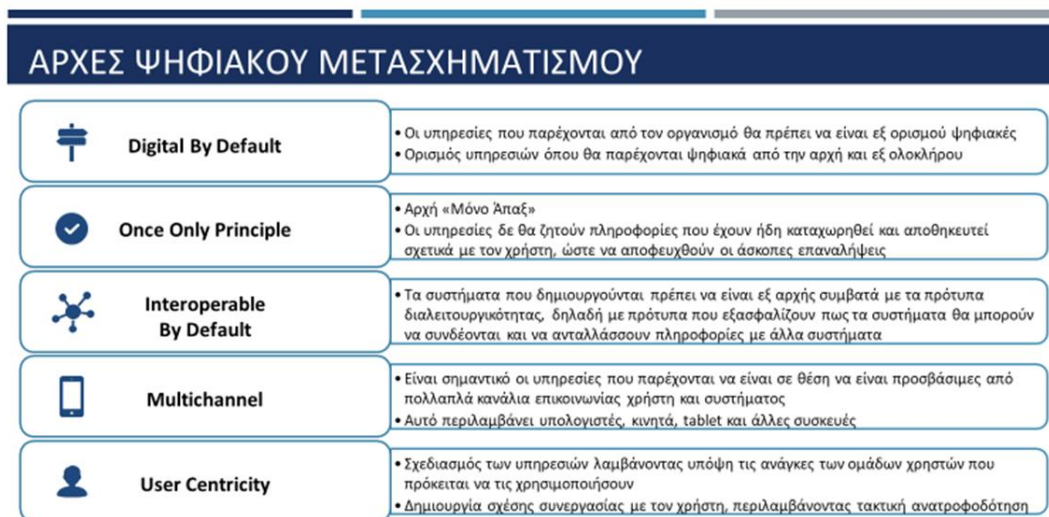


Figure 13. The different types of information slides

Whenever necessary, there were more interactive slides forms included, incorporating icons.



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Figure 14. Interactive information slides

The information slides also differed when the slide presented a definition of a term, including its literature reference.

ΟΡΙΣΜΟΣ

Ψηφιακός Μετασχηματισμός: Η χρήση ψηφιακών τεχνολογιών με σκοπό σημαντικές επιχειρηματικές βελτιώσεις, όπως η βελτίωση της εμπειρίας των χρηστών ή η δημιουργία νέων επιχειρηματικών μοντέλων^[1].

Ο Ψηφιακός Μετασχηματισμός περιλαμβάνει τόσο την ψηφιοποίηση των επιχειρηματικών διαδικασιών με έμφαση στην αποτελεσματικότητα όσο και την ψηφιακή καινοτομία με έμφαση στην ενίσχυση των υφιστάμενων φυσικών προϊόντων και υπηρεσιών με ψηφιακές δυνατότητες και ψηφιακά μοντέλα^[2].

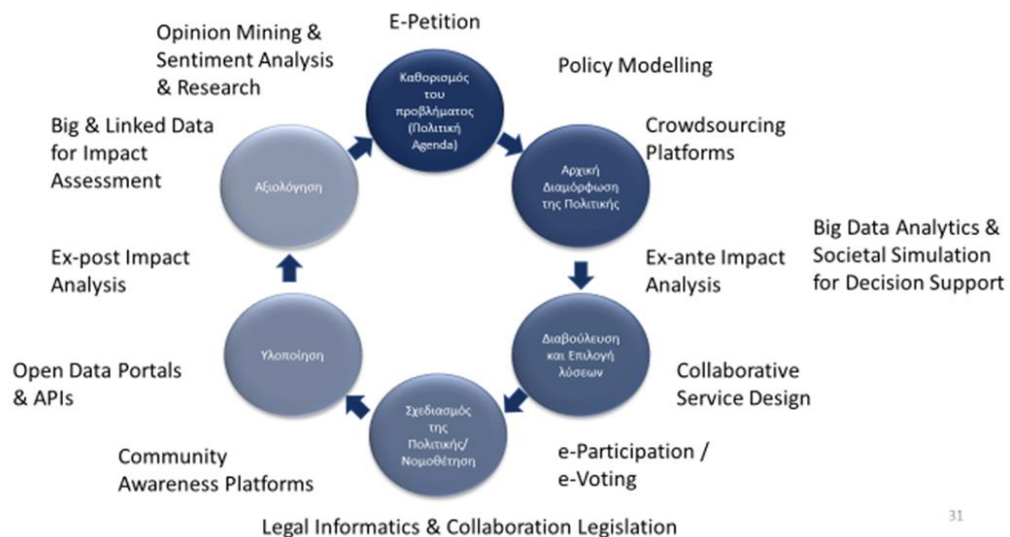
- [1] Piccinini, E., Hanelt, A., Gregory, R., & Kolbe, L. (2015). Transforming industrial business: the impact of digital transformation on automotive organizations.
[2] Berghaus, S., & Back, A. (2016, September). Stages in digital business transformation: results of an empirical maturity study. In MCIS (p. 22).

3

Figure 15. Definition slide

The usage of models and diagrams was also prominent, in order to present the necessary information about the notion discussed.

ΕΡΓΑΛΕΙΑ ΑΝΟΙΧΤΗΣ ΔΙΑΚΥΒΕΡΝΗΣΗΣ ΓΙΑ ΤΗ ΔΗΜΙΟΥΡΓΙΑΣ ΠΟΛΙΤΙΚΗΣ



31

Figure 16. Model slides form

In order to make the information provided more insightful and practical for the trainees who wish to gain more than academic knowledge, and to be informed about the practical case studies that they can simulate in their organizations, the slides also include real case studies pertaining to Digital Governance in various fields.

ΣΥΣΤΗΜΑΤΑ ΑΝΟΙΧΤΗΣ ΔΙΑΚΥΒΕΡΝΗΣΗΣ ΣΤΗΝ ΕΛΛΑΔΑ

Στην Ελλάδα υπάρχουν κάποια συστήματα που υλοποιούν λύσεις Ανοιχτής Διακυβέρνησης. Μερικά από τα παραδείγματα είναι:

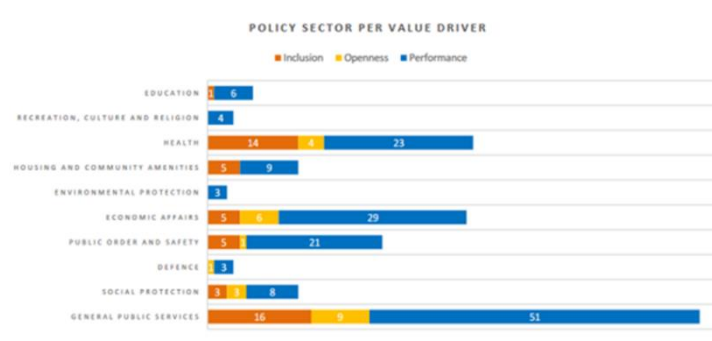
- Ιστότοπος Ανοιχτής Διακυβέρνησης Εθνικού Κέντρου Δημόσιας Διοίκησης και Αυτοδιοίκησης (<http://www.opengov.gr/home/>)
- Διαδικτυακή Πύλη της Βουλής των Ελλήνων (<https://www.hellenicparliament.gr/>)
- Εθνικό Τυπογραφείο (<http://www.et.gr/>)
- Αποθετήριο Ανοιχτών Δεδομένων (<https://www.data.gov.gr/>)
- Πρόγραμμα Διαύγεια (<https://diavgeia.gov.gr/>)

32

Figure 17. Real case studies

For the trainees who wish to get a better grasp of the academic and research aspects of Digital Governance analysis, the slides also include references of studies that are provided by credible public and private institutions.

ΤΟΜΕΙΣ ΠΟΛΙΤΙΚΗΣ ΑΝΑ ΚΙΝΗΤΗΡΙΟ ΔΥΝΑΜΗ ΑΞΙΑΣ



JRC Publications Repository: AI Watch: 2020 EU AI investments. Available at: <https://publications.jrc.ec.europa.eu/repository/handle/JRC126477>

19

Figure 18. Studies' results presentation

The questions provided during each presentation are also carefully designed, in order to challenge but not confuse the trainees. For that reason, there were various question forms included. For instance, there were plenty of matching questions, where the trainee was given a certain set of answers and some examples and was tasked to match them.

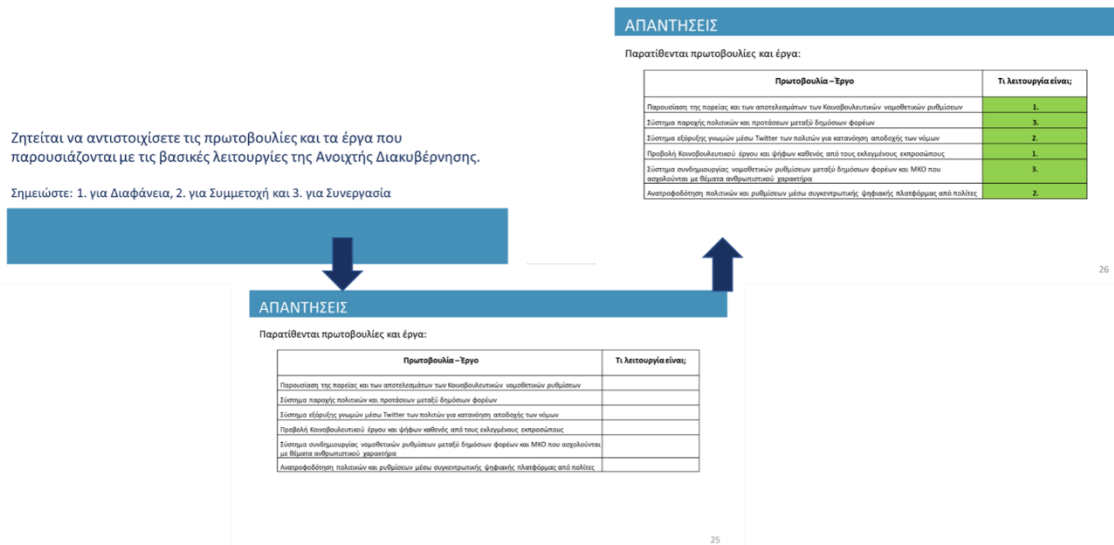


Figure 19. Matching questions

There were also numerous questions that were structured as true/false.

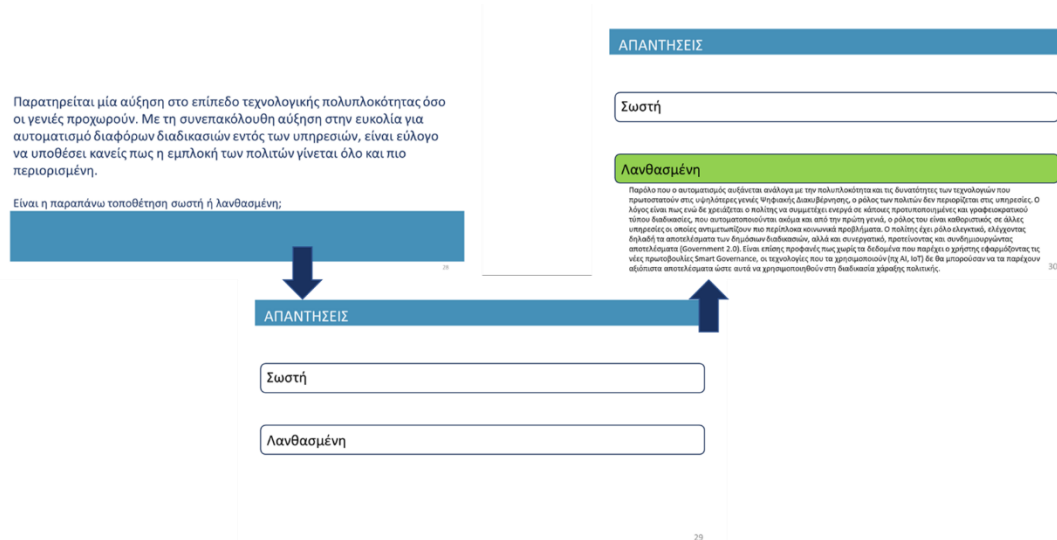


Figure 20. True/False questions

Other questions tasked the trainee to select the right answer from a set of wrongs or vice versa.

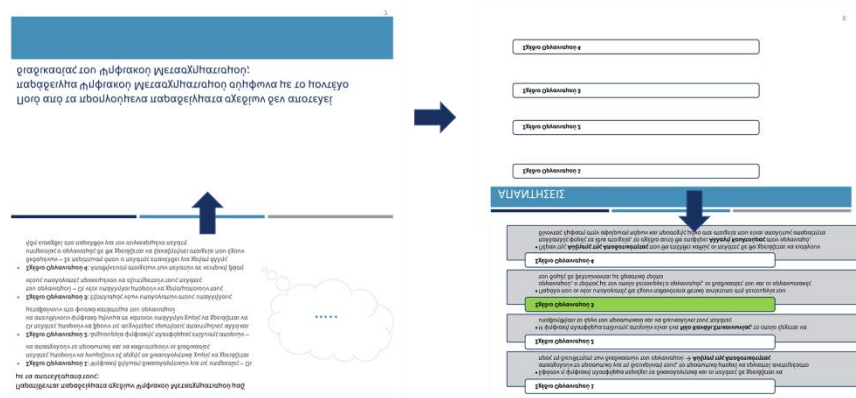


Figure 21. Select questions

There were also some more complicated questions, that required from the trainee to identify some characteristics from a text or an organization announcement, that is relevant to the subject of the module.

ΕΡΩΤΗΣΗ 2

Στο κάτωθι απόσπασμα παρατίθεται κομμάτι των προδιαγραφών ενός συστήματος στα πλαίσια του Ψηφιακού Μετασχηματισμού του οργανισμού.

Η διαδικασία εγγραφής στο Μητρώο Επαγγελματιών έχει δομηθεί προς απλοποίηση προκειμένου να είναι πιο αποδοτική, με χρήση ψηφιακών μέσων. Πρόκειται επίσης να δημιουργηθεί εκ νέου μία συγκεντρωτική βάση δεδομένων χρηστών όπου θα αποθηκεύονται βασικά στοιχεία του χρήστη προκειμένου να επαναχρησιμοποιούνται στο μέλλον. Η ταξινόμηση που θα υποστηρίξει τη βάση αυτή θα είναι η PostgreSQL, που είναι ένα ανοικτού κώδικα σύστημα βάσεων δεδομένων. Η μετάπτωση στη νέα αυτή βάση δεδομένων θα γίνει σε βάθος εξειδίκευσης. Επίσης, η αποσκόπηση του οργανισμού θα ανακατασκευαστεί με βάση τη νέα χωρική παλέτα του οργανισμού όπως καθορίστηκε κατά τον σχεδιασμό της νέας εταιρικής ταυτότητας. Όμως, δεν είναι μόνο αυτές οι αλλαγές που θα γίνουν στην ιστοσελίδα μας, καθώς πρόκειται να παρατεθεί φόρμα ανατροφοδότησης χρήστη. Στο μεσοδιάστημα, η οργανωσιακή και τεχνική υποδομή του συνόλου των ψηφιακών μέσων μας θα υποβληθεί στους σχετικούς ελέγχους προκειμένου να αποκτήσει την πιστοποίηση "General Data Protection Regulation Compliance Certification" αλλά και την πιστοποίηση "ISO 27001 – Information Security Management". Τέλος, έχουμε σκοπό να συνεργαστούμε με τον διεθνή πάροχο συμβουλευτικών υπηρεσιών "International Business Company" για επέκταση σε νέες αγορές.

ΑΠΑΝΤΗΣΕΙΣ

Στο κάτωθι απόσπασμα παρατίθεται κομμάτι των προδιαγραφών ενός συστήματος στα πλαίσια του Ψηφιακού Μετασχηματισμού του οργανισμού.

Η διαδικασία εγγραφής στο Μητρώο Επαγγελματιών έχει δομηθεί προς απλοποίηση προκειμένου να είναι πιο αποδοτική, με χρήση ψηφιακών μέσων. Πρόκειται επίσης να δημιουργηθεί εκ νέου μία συγκεντρωτική βάση δεδομένων χρηστών όπου θα αποθηκεύονται βασικά στοιχεία του χρήστη προκειμένου να επαναχρησιμοποιούνται στο μέλλον. Η ταξινόμηση που θα υποστηρίξει τη βάση αυτή θα είναι η PostgreSQL, που είναι ένα ανοικτού κώδικα σύστημα βάσεων δεδομένων. Η μετάπτωση στη νέα αυτή βάση δεδομένων θα γίνει σε βάθος εξειδίκευσης. Επίσης, η αποσκόπηση του οργανισμού θα ανακατασκευαστεί με βάση τη νέα χωρική παλέτα του οργανισμού όπως καθορίστηκε κατά τον σχεδιασμό της νέας εταιρικής ταυτότητας. Όμως, δεν είναι μόνο αυτές οι αλλαγές που θα γίνουν στην ιστοσελίδα μας, καθώς πρόκειται να παρατεθεί φόρμα ανατροφοδότησης χρήστη. Στο μεσοδιάστημα, η οργανωσιακή και τεχνική υποδομή του συνόλου των ψηφιακών μέσων μας θα υποβληθεί στους σχετικούς ελέγχους προκειμένου να αποκτήσει την πιστοποίηση "General Data Protection Regulation Compliance Certification" αλλά και την πιστοποίηση "ISO 27001 – Information Security Management". Τέλος, έχουμε σκοπό να συνεργαστούμε με τον διεθνή πάροδο συμβουλευτικών υπηρεσιών "International Business Company" για επέκταση σε νέες αγορές.

Process Simplification
One Only Principle
Openness
User Centricity
Data Protection
Security

Πόσες από τις Αρχές του Ψηφιακού Μετασχηματισμού εντοπίσατε στο προηγούμενο απόσπασμα;

Figure 22. Comprehension questions

Since this is an educational course and the trainees may be willing to continue their study over the subject that was briefly introduced through the training course, each module includes some notable references corresponding to the subject and the data presented in the slides.

ΕΝΔΕΙΚΤΙΚΕΣ ΠΗΓΕΣ

- Kankanhalli, A., Charalabidis, Y., & Mellouli, S. (2019). IoT and AI for smart government: A research agenda. *Government Information Quarterly*, 36(2), 304-309.
- Papadopoulos, T., & Charalabidis, Y. (2020, September). What do governments plan in the field of artificial intelligence? Analysing national AI strategies using NLP. In *Proceedings of the 13th International Conference on Theory and Practice of Electronic Governance* (pp. 100-111).
- Alexopoulos, C., Lachana, Z., Androutopoulou, A., Diamantopoulou, V., Charalabidis, Y., & Loutsaris, M. A. (2019, April). How machine learning is changing e-government. In *Proceedings of the 12th International Conference on Theory and Practice of Electronic Governance* (pp. 354-363).
- Androutopoulou, A., Karacapilidis, N., Loukis, E., & Charalabidis, Y. (2019). Transforming the communication between citizens and government through AI-guided chatbots. *Government information quarterly*, 36(2), 358-367.
- Haenlein, M., & Kaplan, A. (2019). A brief history of artificial intelligence: On the past, present, and future of artificial intelligence. *California management review*, 61(4), 5-14.

Figure 23. Reference slide

Finally, one could observe the consistency of the slides presented. All the slides were created in Greek (since the CoE is Greek and the first prospective trainees are members of the Greek digital ecosystem), even though it is possible that the future training courses might have an English version.

The design principles were also carefully followed, with the slides being written using Calibri font, and a consistent color palette (dark blue for the information slides and light blue for the question slides).

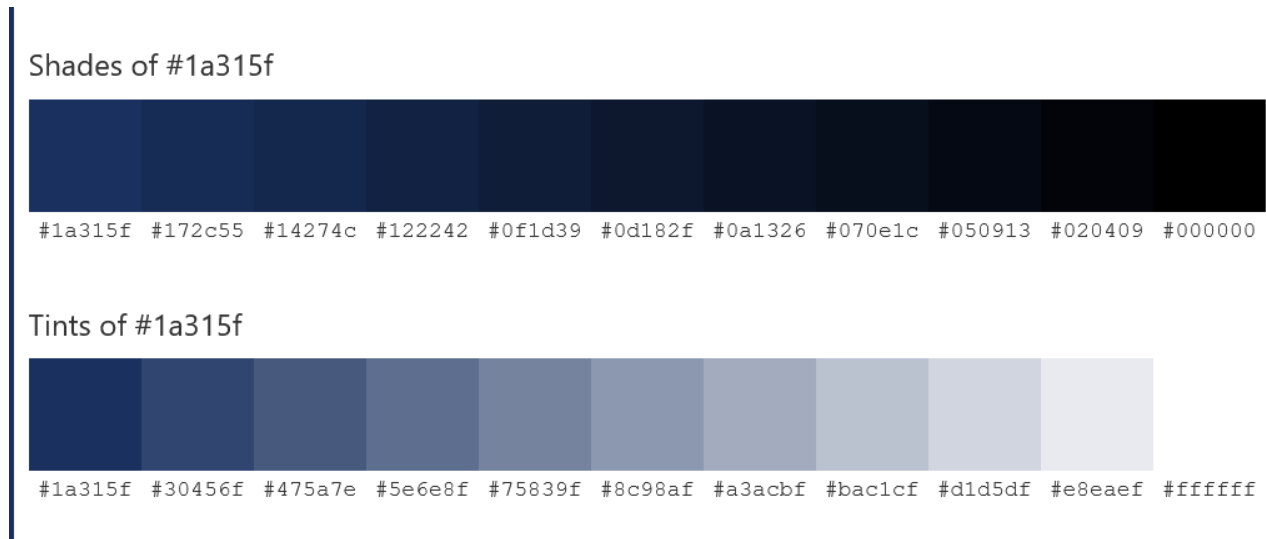


Figure 24. Color palette for the information slides (<https://www.color-hex.com/color/1a315f>)

5

Discussion

5.1 Discussion on the Results

The results reveal significant potential for the research and development community to incorporate in the way of providing services in several thematic areas, in Digital Governance and relevant areas, such as Entrepreneurship and Digital Innovation.

The results are hereby discussed and expressed in regards to their impact to the scientific and industrial community.

5.1.1 Impact

A CoE is proven to be a great academic and non-academic instrument, serving in the research excellence, the education progress and the production of innovative solutions that will be implemented in already existing organizations and structures, increasing their effectiveness. This is comparable with already existing cases of CoEs and their positive effect in several academic areas, as literature suggests.

Additionally, it can assist existing organizations and companies to advance their potential using digital means, to increase their efficiency, to innovate, to increase their revenue streams, to be more open and collaborative and to be prepared for the future of digitalization and development. The consultancy provided by an entity that aims at excellence in a particular sector or scientific field is of paramount importance for an organization, in order for the latter to be able to perform properly in a specific field. Closely related to the consultancy provided by the CoE, the certification that many organizations and businesses may seek is also a significant contributor to the market, since an institution with deep understanding of one particular field can vouch for a company's or an organization's capacity to deliver services closely related to that field with the necessary quality. Thus, the overall market quality increases and the CoE can find new revenue models implementing that service, while simultaneously expand its knowledge base over the capabilities of the current market.

The CoE can also assist the innovative ideas to reach the development. That is apparent by studying already existing research cases, where the CoE acts as a funding mechanism or at least as

a funding connector. And since the innovative startup ideas are in need of funding, the CoE could provide them with council and reference them with collaborating funding entities.

The notion of the CoE is almost equivalent of a knowledge hub, or an observatory of the current developments in a given field. This notion is especially true for the CoEs that focus on technologically related subjects, where the availability of data is plentiful and the CoE can be an accommodator of visualized and categorized information based on the existing data. The availability of these data and information free and open is a linchpin for the research development and communication.

Since the CoE is usually an academically related institution, its connection with the students is prominent. Afterall, these students are the researchers, practitioners and professionals of tomorrow and they are in need of enhancement to their capabilities and experience, for the good of their progress and for the good of the community. Connecting them with the market is one of the most useful long-term strategies in order to serve the scientific field of the CoE.

For all of its work and achievements, a CoE is not an abstract entity. It is comprised of many individuals who work together, forming a community. This community should be actively engaged in order to stay active and in order to cocreate the initiatives pertaining to the subject of the CoE. It is the CoE's role to interact with them on a regular basis and to organize community events, such as conferences, summits, events, activities and workshops.

Since the CoE acts as an observatory of the current status in the relevant research, policy, market, development and movement developments, it should also notify its followers for these events on a regular basis. Creating informational news articles, blog posts and newsletter emails, the CoE can keep its community updated while simultaneously increasing its visibility and its user engagement.

All these impact characteristics of the CoEs apply to the DGRC. They are made through the provision of carefully selected services that will serve the Greek and the international Digital Governance market, targeting businesses, public organizations, HER institutions, non-governmental organizations, individuals, and communities. Thus, the whole ecosystem is positively affected and the Digital Governance community can be expanded, while simultaneously gaining visibility and excel in their respective domain.

5.1.2 Research Establishment

By establishing an institution solely aiming at excelling at researching and developing new directions on a scientific field is advantageous for both the research output and its visibility. On the one hand, the research output will be maximized, since there will be more funding towards producing it, more structurization of the related knowledge, making it easier for more researchers to extract further study results and more training for individuals who wish to start researching the domain. On the other hand, the visibility of the research domain is also planned to increase. By establishing a CoE, the research community will have a reliable entity to promote the research endeavors, to organize community-related events, to create simplified content in order to make the knowledge accessible and understandable for the public, to consult companies and organizations in order for them to implement appropriate solutions and thus to become members of the community,

to help its younger members to find the experience they need and generally to increase both the size and the capacity of the community.

Thus, establishing DGRC as a CoE that will actively engage in the research and educational activities relevant with Digital Governance is beneficial for both the scientific area and the scientific community. That is especially true for the Greek community, since the market companies and public organizations are in need of guidance from experienced teams regarding the digital transformation. The situation is similar for the students and young professionals, since Greece is ranked high in unemployment rates while simultaneously hosts a number of inspiring companies that deal with digital transformation. Lastly, there is a certain number of Greek academics that are prominent in the field of Digital Governance, so forming a community to bolster their work dissemination and in parallel invite more academics to work in this scientific field is beneficial for both the field and the Greek community.

5.1.3 Dissemination

In order for the CoE to succeed and to achieve the goals previously mentioned, there is certain need for extraversion in its attempt to attract community members to work together. The call for partners is expected to reach all the academic institutions in Greece and abroad, showing flexibility in their scientific fields, since Digital Governance is a scientific field with many neighboring and collaborating domains.

The roles that are in need are several, and many academic members can provide diverse approaches on several subjects. For instance, academics from institutions with strong reputation in digital transformation may be well-suited for partnerships in regard to the consulting and certification services, while others with strong reputation in training course and seminars creation can propose valuable ideas for the training service.

The academic ranking is not an obstacle in choosing the partners for the CoE, since there are academics with insightful ideas in all the rankings. The partners can find positions suited for their academic ranking, starting with repetitive duties (such as news and articles creation) for the students and young researchers, reaching to more complex tasks (such as research projects coordination and proposal) which are more suited for Full Professors.

The agenda and the more specific services emerged over the course of years in the CoE are expected to be the product of the collaboration between the academics called to participate. The success of the CoE lies in its diversity and its capacity to incorporate it in the research, the services and the training curricula it provides.

The value of DGRC serves not only the scientific community of Digital Governance, but rather the majority of the general scientific community, especially in Greece. Since Digital Governance is a diverse field of expertise, the results of the collaborations may benefit other academic disciplines and communities too. The innovation, closely tied to the digitalization of the public services, is based on the premise that multiple and diverse people will provide their views on the matter in order for the outcome to be adopted by the wide majority of the users.

The dissemination strategy for the creation of the DGRC will emphasize the fact that the CoE is expected to be an expandable entity, with the number of members and the services being

constantly increasing and the directions of the services and the members' interests also being varying over the development of the CoE. Each new academic partner may contact their own partners (private and public organizations) for collaboration, in order to achieve better level of inclusion of the Greek and international ecosystem and provide solutions that are founded on a larger set of organizations. The same applies for the students and young researchers of each institution.

6

Conclusions and Prospects

6.1 Conclusions on the Methodology

The methodology served decently the scope of this study. By starting to study the general characteristics of a CoE, the next research steps were articulated more accurately formed, having the knowledge of how relevant studies have formulated their course of actions. The field analysis included a decent level of analysis, the service ranking was reasoned to a satisfactory extent, the service description provided a general overview of the services, the service specification analyzed all the necessary aspects for the generation of a service and the service creation provided an exemplary case of how a CoE service is conducted. Overall, the methodology was successful.

One useful addition that would make the research methodology even more complete would be the addition of reviews for the service sets, their categorization, their analyses and their content, if they are created. The reviews could be provided either by the prospective CoE members or by some selected experts in the field. That way the services would be clustered also based on their performance on that assessment, which is crucial since it represents the acceptance and the adoption of the services.

Generally, the methodology itself did not face any major obstacles. It could be utilized for the study of CoEs in different scientific fields and even be expanded for the study of other types of research institutions. The categorization may differ in certain points, but overall, it is an insightful approach when examining academic entities.

6.2 Conclusions on the Results

The results and their analytical depiction were satisfactory in terms of analyzing the existing situation in the CoEs. It is reasonable to state that the research and the relevant studies in analyzing the existing research and CoEs could be further expanded, since there are not enough studies analyzing the particularities of the CoE trends and directions in multiple scientific disciplines in order to formulate a solid knowledge on how these institutions advance their respective scientific fields.

As for the CoEs and their services, one could argue that the statement of their services is not particularly apparent when browsing the websites. In some instances, the effort to identify the exact service titles and to formally categorize them into the analysis groups was notable, and thus it would be advantageous if the online public profiles of the CoEs would state their services in a clear manner. That would serve the researchers that wish to structure a common analysis and the CoE members who would be able to communicate their vision and their services to the everyday users clearly. Yet again, this diversity of expressing the aims and objectives of the work of every CoE may be a factor of the academic diversity in the CoE communities.

The analysis revealed the ten services that could be chosen to be implemented in a Greek CoE that wishes to excel at Digital Governance. Some of these services are necessary for nearly every similar CoE, with some of them being a driver of innovation for scientific development of Digital Governance. The most prominent of them were selected to be specified and thus the full analysis of those services was achieved. As a result, theoretically, they are ready to be designed and implemented by an actual team of scholars working towards the establishment of an academic CoE and its service provision. The exact aspects specified regarding these three services, were actually based on the needs of the design team of an academic institution based on previous experience in academic development. Finally, the service implemented is a prototype of how this exact service would be distributed to the users. The service does not include the technological capacity or the audiovisual files that may be included in a training course, but it is analyzed in a satisfactory level. Additionally, the training service is not solely represented through training courses, since there are also other service means to educate the public, such as the training events or the creation of educational material and its online provision in a form of a library.

Overall, the results are provided at least to the degree that the respective scientific community can utilize them in order to start implementing the services and the content for a CoE focusing on Digital Governance and to outline the strategy of dissemination of these services to the prospective users.

6.3 Limitations of the Research

The study had the limitations pertaining the type of services provided by the CoEs and their not apparent definitions. As a result, the analysis was assumptive based on the logical categorization of common services, even though they might differ in their implementation means and their particularities in their process. The results of the categorization should be considered, especially because the services provision may be altered over the course of time, during which this study was conducted.

Additionally, the services should not be automatically assumed to be identical, since each legislative framework, market and academic system of every country is unique. Consequently, mirroring a service for the needs and ecosystem of another country's or even slightly different thematic scope's CoE may not be as successful as it is expected to be, since the success or failure of the services should be considered depending on the unique conditions in which this service turned out to be successful.

Finally, taking the services provided for DGRC as fully implemented examples of the services that will eventually end up being offered poses some challenges, since the team, the organizational structure, the legal entity, the exact funding or revenue model as well as the collaborating organizations are not already defined. That may influence the available means, the capacity or the eligibility of the CoE to provide these services as they are hereby defined.

6.4 Prospects - Next Steps

The next step for this endeavor is to develop the actual web platform that will host the CoE's activities and material. This web platform will be the gateway for the services, and the participation to the activities of the CoE, so its careful implementation is of paramount importance, from the design to the functional implementation. Additionally, one of the next steps is to actually implement all the selected services. Some of them are easily produced (i.e., blog), while others require more deliberation (i.e., certification service). Even for those that the specification has been made, the actual implementation requires regular communication with the collaborating members and academics. As for the service that is already implemented, there is a certain need for additional check of the content, audiovisual content creation, as well as searching for the suitable course instructor. Yet again, the training course is not the only aspect of the training service, so the rest of the aspects are also in need for design and implementation.

On the research level, one potentially impactful future step is the study that provides a comprehensive analysis of the success and failure factors of CoE services in the domain of Digital Governance and Digital Transformation. That would provide useful insights for the academic community to understand the current directions of Digital Governance, for the market stakeholders to understand where to invest, regarding the service provision of their companies, the public organizations to identify opportunities of collaborations in order to enhance their own services and the students to get a grasp of the trends and directions of the future of this domain, in order to be more informed before they pick their studies and expertise.

This study was a promising start of several events and activities in order to continue setting the foundations of the Digital Governance scientific domain and to further expand the capacity of its community of academics, professionals and students to cope with the needs of the developments and to be active members of these developments, through collaboration and cocreation. This study aspires to be used as a start for other researchers to continue the analysis of its research results and to further develop its suggestions for the creation of an innovative and active CoE in the area of Digital Governance.

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Appendix