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Interconnected Government Services: An Approach toward Smart Government

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Abstract: The rapid expansion of new technologies and services significantly affects society's development and initiates significant changes within public administration. Many have decided to implement citizen-centric, data-driven, and performance-focused governance and prepare to transform the existing e-government system into a smart government. Along the way, they have encountered problems such as flaws in existing legislation and in the integration of heterogeneous infrastructure from technical, financial, and privacy perspectives. We propose a new approach to information system modeling that introduces an integration layer for existing databases and services and suggests the application of several innovative technologies to achieve better problem-solving, optimal utilization of resources, and policy innovation. To test the effectiveness of the proposed solution, we have used corresponding weighted digraph models to confirm that the proposed solution achieves the desired effects. We have used the time required to collect documents to measure similarity. The obtained results prove the efficiency of the proposed model and indicate that the same model could be used elsewhere in public administration.

Keywords: E-government; open data; smart government; interconnected government services

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Citation: Bojović, Ž.; Klipa, Đ.; Bojović, P.D.; Jovanović, I.M.; Šuh, J.; Šenk, V. Interconnected Government Services: An Approach toward Smart Government. *Appl. Sci.* **2023**, *13*, 1062. https://doi.org/10.3390/app13021062

Academic Editors: Sergio Nesmachnow, Luis Hernández-Callejo and Pedro Moreno-Bernal

Received: 1 December 2022
Revised: 8 January 2023
Accepted: 9 January 2023
Published: 12 January 2023

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1. Introduction

The emergence of new ICT technologies had produced numerous changes in society and takes an active role in solving problems, creating preconditions for developing new and positive perspectives. Their rapid development and broader implementation has triggered further transformation from an information society towards a more intelligent society. The concept of the information society has implied that information appears as a determining factor that causes radical changes in every field of society. By implementing information technologies in almost all parts of society, technologically driven goals provide new opportunities for citizens [1]. The transformation to a more intelligent society implies building a sustainable, inclusive socio-economic system powered by digital technologies (e.g., big data, artificial intelligence (AI), the internet of things, and robotics) [2]. In other words, it is necessary to implement an innovative approach to society's governance processes [3]. Such a society focuses on the opportunities that governments and policymakers should provide their citizens by applying advanced technologies and creating smart environments [4]. Among other aspects, this concept includes leveraging data analytics, e.g., a more in-depth examination of data dependency from different authorities, empowering the authorized person with access to the analytic results.

The expansion of new technologies such as the internet of things, social media, artificial intelligence, and mobile (5G and 6G) applications is continuously affecting changes in the work of public administrations [5]. Numerous governance, policy, and service innovations follow technology trends, enable the transformation of public administration, and improve government–citizen relationships. Administrative bodies at different levels (municipal,

regional, or state) apply different tools and create new services to keep up with rapid societal changes. Some are focused on administrative innovation in the public sector, with little use of new technologies. Others are devoted to new technologies that change the work of the public sector.

The rapid digitalization of public administration introduces the next phase in establishing a more intelligent and agile administration as a part of a smart government environment. It implies implementing new and more sophisticated services to keep up with the needs of society and directly affects citizens' satisfaction [6]. We must think of it creatively by combining new technologies and organizational innovations. The benefit of such a combination is less about the tools used in service delivery and more about collaboration and the opportunity to understand the citizens' needs clearly. The increasing pervasiveness of digital technologies and data variety shapes these new needs.

However, the achievement of more intelligent administration produces numerous organizational, legal, financial, and technical changes that burden service implementation. That is why a smart government includes many initiatives that lead towards the modernization and reorganization of public administration. It provides customer-oriented electronic public services of different authorities to citizens and stakeholders from a single point of access. Many services that result from collaboration between different institutions (interconnected government services—IGS) could be more efficient. Regarding the main problems, we recognize the following.

With our early research, we conducted surveys in Serbia and encountered communication problems between public administration bodies [7]. The existing service solutions in many countries require the excessive transfer of a requested document, often in paper format. The request is received in a municipality, processed there, and forwarded (periodically, after gathering a certain number of documents) to a central office within the public administration. In this way, the service implementation requires significant interaction between information systems developed by autonomous and independent administration bodies. A lack of interoperability causes inefficient data exchange between public authorities [8] because flaws in existing legislation impede a more intelligent method of managing information systems within the state administration.

The required data are usually located in separate databases, in various locations, and possessed by different public administration bodies. Data transfer from one part of public administration to another poses the problem of privacy protection. The main challenge is integrating heterogeneous computer systems within a public administration's jurisdiction from a technical, financial, and privacy perspective. During the last couple of years, the importance of these efforts has become enormous. ICT adoption in government organizations mandates that information flows smoothly between an organization and its constituent parts [8]. On the other hand, implementing such solutions poses the threat of privacy violations when transferring data. It can accidentally release policy-sensitive data, with the risk of data misuse and challenges regarding the ownership of data [9].

The current situation in public administration inspired us to conduct the research presented here and propose a model that should provide better interoperability among various information systems through database integration. Our solution allows for the processing of input data (according to defined service procedures) from heterogeneous databases without leaking sensitive data. Therefore, the main contribution is a model suggesting the application of several innovative technologies to achieve better problem-solving, the optimal utilization of resources, and policy innovation. We have used a (di)graph theory model to confirm the efficiency of the proposed solution on a specific public administration policy (e.g., the child-benefits policy [10]). After modeling the current state and the proposed solution, we compared the corresponding digraph models using digraph weights, which are related to the time required for collecting the documentation/documents.

This paper is organized as follows: Section 2 provides an overview of the e-government research. A focus is its transformation into a smart government with potential challenges (such as data privacy) based on existing literature. Section 3 presents a new approach to

information system modeling that introduces an integration layer for existing databases and services and suggests the application of several innovative technologies. In Section 4, we perform an efficiency test of the proposed solution using graph theory to model the current and proposed state. We compare the time required to collect documents and process citizen requests, and we validate the effectiveness of the proposed model. In Section 5, we discuss the results. Section 6 concludes the paper, summarizing the main contributions.

2. Related Work

The following subsections review current issues in establishing a smart government environment and some proposed solutions. Additionally, we have reviewed privacy issues that burden this process to support and conceptualize our approach both theoretically and technically.

2.1. Overview of Smart Government

We can identify three approaches regarding a smart government in practice and in the literature. The first approach (the so-called extended smart government) considers a smart government as an extension of the traditional e-government system with various intelligence applications. This admin-centric approach needs to be more transparent. It leads to the evolution of a closed system that reduces the possibility for citizens to influence the work of the public administration and criticize its weaknesses more actively. The second is a more avant-garde approach, which combines smart cities and the Government 2.0 system [11]. The Government 2.0 system is a solution analogous to Lincoln's "Government of the people, by the people, for the people" and is about "putting the government in the hands of citizens" [5]. It aims to leverage improvements in every public administration segment while maintaining privacy (under the legislation and international standards) and creating an open-source platform for multi-stakeholder collaboration [12]. The third approach focuses on the open-government trend and introduces the Government 3.0 concept to actively share public information for better collaboration and remove existing barriers among government authorities. This concept requires the total commitment of the government authorities to provide open collaboration between stakeholders [13]. Many studies focus on the technological capacities of government; however, we should also consider the affinity of openness and democratic governance. The authors in [14] attempt to conceptualize how governments harness technology innovations and compare ten open-government maturity models using the qualitative meta-synthesis method to find their similarities and differences. Finally, the authors present a comprehensive model that evaluates the open-government initiatives holistically and includes the following six stages: (1) an initial stage; (2) a transparency and accountability stage; (3) an open-collaboration stage; (4) a platform stage; (5) a democratic open-government stage; and, finally, (6) an open-governance stage.

The professionals use different definitions of smart government. In [3], the authors state that smart governments, organizations, and networks within political jurisdiction use innovation strategies to better understand their communities and constituencies (being percipient). At the same time, they should accurately assess situations or people (being astute), show sharp powers of judgment (being shrewd), make decisions, and respond quickly or effectively (being quick).

The earliest mention of smart government dates back to a short World Bank report on civil service reform in 1997 [15]. According to the International Data Corporation [16], smart government is "the implementation of a set of business processes and underlying information technology capabilities that enable information to flow seamlessly across government agencies, including their individual and joint initiatives." Smart government environments are subject to a large variety of data sources, including big and open data, and therefore interoperability becomes increasingly important, as highlighted in [17]. Today, public administrations possess the correct data but need to use it optimally. The reason is insufficient collaboration between different state institutions and restrictions derived

from implemented technical solutions and privacy issues. The computer infrastructure for e-government is a result of independent initiatives within different state bodies. Since there are differences between internal organizations within governmental systems, application programming interfaces (APIs) should be introduced to enable them to communicate with each other. According to [18], the open-data concept represents a solution where it is possible to combine the data of public institutions and make it available for citizens and private and non-governmental sectors. This concept should stimulate economic growth, make public administration more efficient and economical, provide better-quality services for citizens, ensure transparency, and reduce the scope for corruption. So, the benefits are (1) political and social, (2) economic, and (3) operational and technical. They are related to citizens' better awareness and capability to use e-government easier, faster, and more effectively.

The effects of open-government initiatives are considered in [19]. The authors have introduced the metrics and processes for measuring the success of such efforts [20]. Smart government should enable free access, and unrestricted information flow within the public administration and between some of its authority bodies and citizens, as stated in [21]. According to professionals, data openness and open administration are of great importance. According to [22], the implementation of the e-government aims to make the government-to-citizen (G2C), government-to-business (G2B), and government-to-government (G2G) interactions more efficient and transparent. Two factors significantly influence the qualities of these interactions: (1) governmental policy, which makes the data available, and (2) the use of information technology.

Many governments are trying to reduce costs and stimulate organizational innovation. Consequently, the authors of [23] have proposed the idea of a third-party service to accomplish this. However, the authors of [24] report that this is not easy in practice as there are privacy-related problems with open data disclosure. Therefore, a nuanced approach is recommended, avoiding releasing data for its own sake. Besides that, a legal framework for data release might be helpful. This approach is necessary for data-release strategies because of all of the implications of the service's implementation. For this reason, it is necessary to consider how data are stored, accessed, and formatted, as well as the financial, legal, and other aspects.

Smart government is based on the foundation of smart governance, suggesting that both concepts are closely related [21]. Public administrations demand more intelligent technologies to connect with citizens and understand their demands. The authors in [25,26] emphasize that much-needed information exists on social media, where members of diverse groups share different interests, post statuses, and review and comment on various topics. Generally speaking, moving towards a smart government relies on improvements in organizational, technical, safety, and other interoperability aspects [27]. In summary, the professionals have only developed rudimentarily smart-governance and smart-government concepts so far [28].

2.2. Privacy Issues

Implementing technical solutions that simultaneously solve the lack of interoperability within government institutions can create other non-technological challenges, such as data privacy. These solutions generate an increasing number of real-time data. Making these data open to create more transparency can be a positive goal. However, it can also endanger personal data privacy and lead to illegal data use [28].

Digital technologies and services based on them give governments additional power, which can sometimes affect the degree of democracy in a country. That is why, in [29], the authors point to the potential privacy issue when the government implements the unethical usage of personal data by digital tools. Such privacy concerns are not new in the literature as several cases of personal data misuse exist. For instance, the Swedish government has faced the challenge of leaking personal data related to vehicles. This leak forced the Swedish government to restrict outsourcing private and sensitive data to third parties [30].

Achieving high degrees of privacy and transparency is a big challenge 29]. Many authors think implementing services based on advanced technologies can overcome technical challenges. There are also legal, ethical, and political issues related to the government and the citizens' relationship [31]. For these reasons, it is necessary to define a suitable approach that will find the right balance between the need to control government work (which refers to the governance method and division of responsibilities) and secure the individual's privacy. The key idea is to create an access policy to prevent any entity from accessing all of the data. Thus, the risk is not the data itself but how is the data are used, which includes the data-sharing method and the underlying infrastructure [32].

In [33], the author proposes developing a legal framework to deal with various data sources and government services. In Europe, personal data usage is defined according to the general data protection regulation (GDPR). This regulation has motivated many governments to consider introducing a consistent framework for exchanging, sharing, and purchasing data to ensure the ethical use of new technologies [34].

3. The Methodology

Establishing a more intelligent public administration requires defining a new model and appropriate procedures for IGS. Its implementation requires interoperability between different and independent information systems, protecting users' privacy and data integrity in all of the existing databases [35]. We propose a solution that separates the data processing from the data storage and enables an application to communicate with a single instance, despite multiple database nodes acting over the data. Our goal is to obtain data from various databases without investing in new expensive systems for data storage (databases remain in their current locations, entirely functional and self-sustaining) or taking the time for data preparation.

Thus, the proposed model introduces a layer of integration that ensures data collection from existing software platforms (operative systems, application servers, and databases) and the execution of a particular instance (a service function, e.g., child benefits). The system will determine which databases store the requested data if an application requests access to a single instance at this layer. In this way, we enable the actual processing of data to be distributed to multiple database nodes.

The most important problem is maintaining the end-users privacy and the integrity and mutual collaboration of different databases. The information about the technical properties of the data format needs to be more relevant in this case. Different data types are published in a single format using the wrapper-mediator methodology [35], which has proven to be very effective at solving such problems. Figure 1 gives the basic structure of this model, which separates responsibilities into two conceptual components, the mediators and wrappers (described in the text below).

This model implies that we divide the service request into several sub-requests executed in parallel over the bases, reducing the total processing time. The role of the query mediator (QM) is to handle users' requests and provide unified data access while every data resource connects to its wrapper [35]. The QM is a software engine that transforms user queries into subqueries, performing queries on data from different sources. Translating the query into queries against local schemas is called query mediation. It involves two steps: query planning (transforming the given query into subqueries) and query execution (sending queries and collecting results).

The wrapper is a resource adapter that interacts with particular databases to prepare data in a format suitable for the integration mediator (IM). In that way, we achieve abstraction and hide heterogeneity. Original data are not moved from their location but only viewed and adapted to the required format before transfer to IM. Since there is no need for copying data, it positively impacts data privacy. Hence, instead of users collecting the documents from numerous authorities, this model passes just the necessary data to the IM, under a user code number (UCN), without identity [36]. So, information about the individual to whom the data belongs is neither transmitted nor stored.

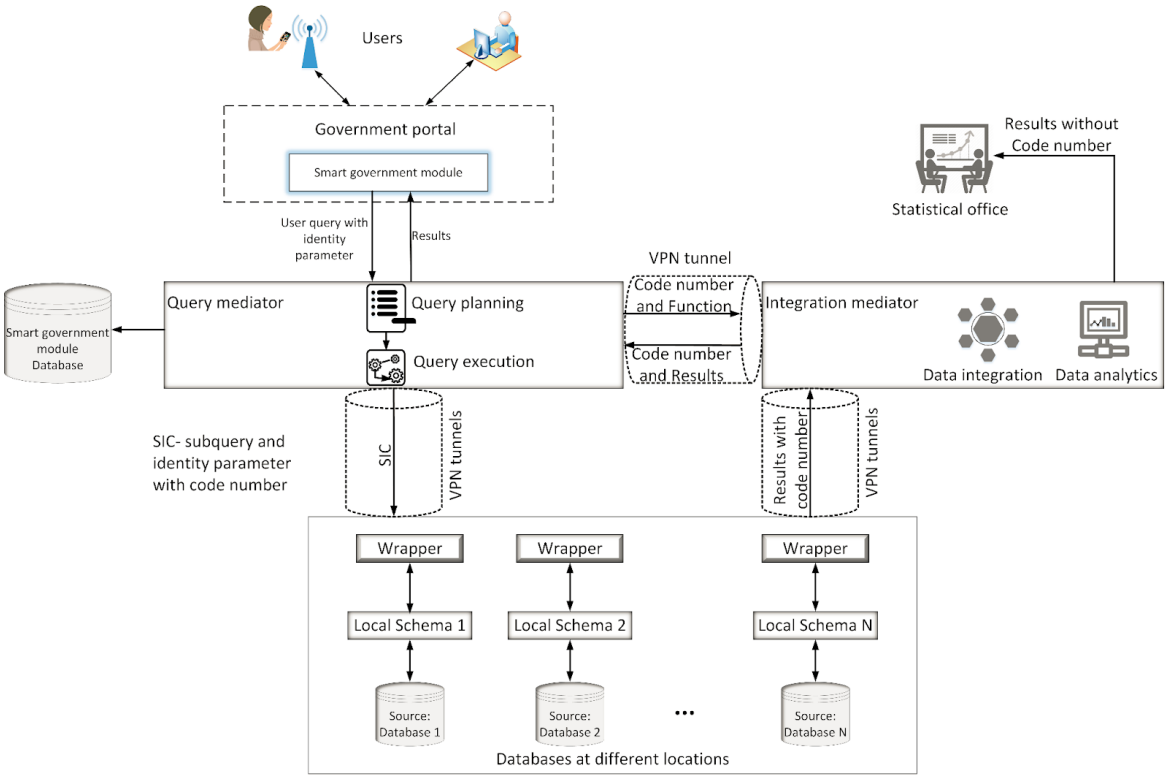


Figure 1. The design of the proposed model.

In the proposed model, the end-user creates a software entity that needs to grant it a service function (e.g., child benefits, disability pensions, financial assistance, and social assistance) based on information from separate sources (i.e., databases). The role of IM, as a software entity, is multiple:

- To create a UCN that would be associated with the user identity;
- To create subqueries for the required service function (one subquery for each database needed, not giving the details of the service function required);
- To create IM under UCN, with the task of collecting data and calculating a specific service function based on them;
- To provide the local databases with UCN, the identity parameters of the requesting person, and data specification (subquery) (necessary to calculate the respective function);
- To pass the decision obtained under the UCN from IM to the government portal (competent to give the information to the potential user) and the database of users of the specific service function.

Based on the received packet consisting of a subquery, an identity parameter, and a code number, each local database's task is to search and find the requested data, which is delivered with the code to IM at its address (without identity information).

The role of the IM is to obtain the results of all searches under the given UCN, calculate the service function derived from the data for that UCN, and submit the result back to IM. The IM has two features (Figure 2). First, it enables every user to formulate his/her requests and obtain an almost immediate decision upon them. Secondly, implementing the IM does not reveal information about the user's identity simultaneously with the sensitive data related to him/her. It also enables the use of tools for producing different on-demand aggregated (statistical) reports for higher-level functions of the smart government (such as the average age, salary, sex, and location of the users of a particular service). This additional function creates the analytic database needed for defining governmental policies, such as measures of social and population policies in society. With the implementation of the new model, governments can conduct complex analyses. They can foresee the necessary

funding for different benefits within the state budget; stop potential abuses; and make adequate, efficient, and targeted social and population policies.

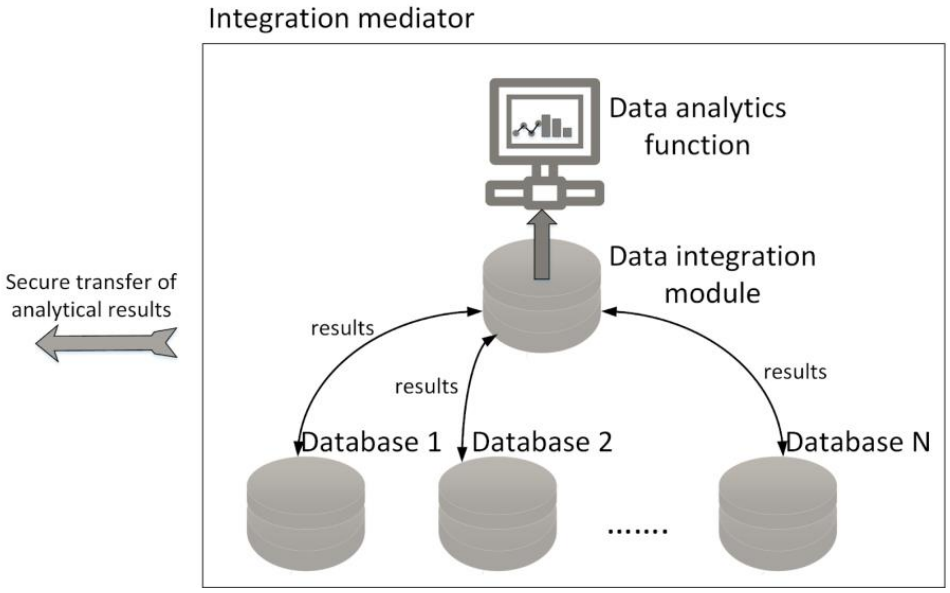


Figure 2. The logical architecture of the Integration mediator.

4. Results—Model Evaluation

We evaluated the proposed IGS solution in two ways: by practically implementing the solution in a test environment and by creating a mathematical model based on weighted digraphs. The proposed model is evaluated in the example of the application for obtaining child benefits in the Republic of Serbia. By this model/example, the problem regarding applying the current solutions in public administration is perfectly illustrated. Developing a practical solution helped us verify the proposed solution's feasibility in controlled laboratory conditions. Integrating autonomous databases is a justified and logical step in upgrading public administration procedures. Furthermore, in addition to the proof of the practical implementation feasibility, the advantage and improvements brought by the proposed solution can be seen very clearly through a mathematical model that deals with weighted digraphs [37,38]. In that way, we emphasize the difference in terms of the communication complexity and the delays of the traditional documentation-obtaining model compared to the proposed IGS model.

A Model Based on Weighted Digraphs

The real-life process currently present in the Republic of Serbia regarding the collection of the documentation necessary for applying for child benefits and the newly proposed virtual procedure for collecting and processing the required data is modeled using weighted digraphs. Nowadays, the theory of graphs and digraphs is widely developed. Many diverse problems from theory and practice are considered using mathematical results from this domain of science. Digraph G_1, presented in Figure 3, corresponds to the current process of collecting the documentation in the Republic of Serbia. Digraph G_2, presented in Figure 4, serves as a model of the newly proposed virtual procedure.

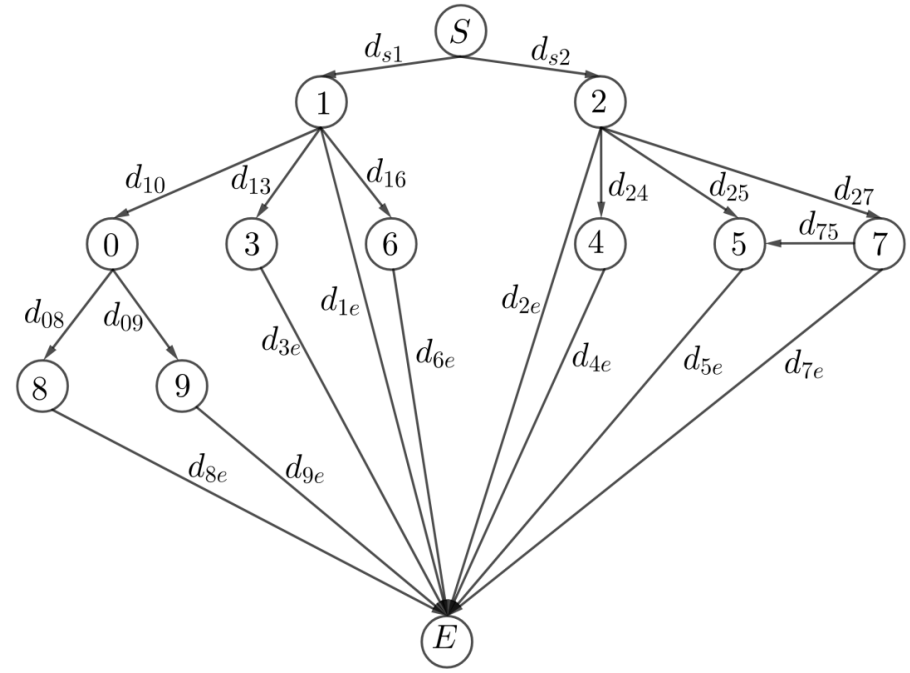


Figure 3. Digraph G_1— the current procedure in the presented example.

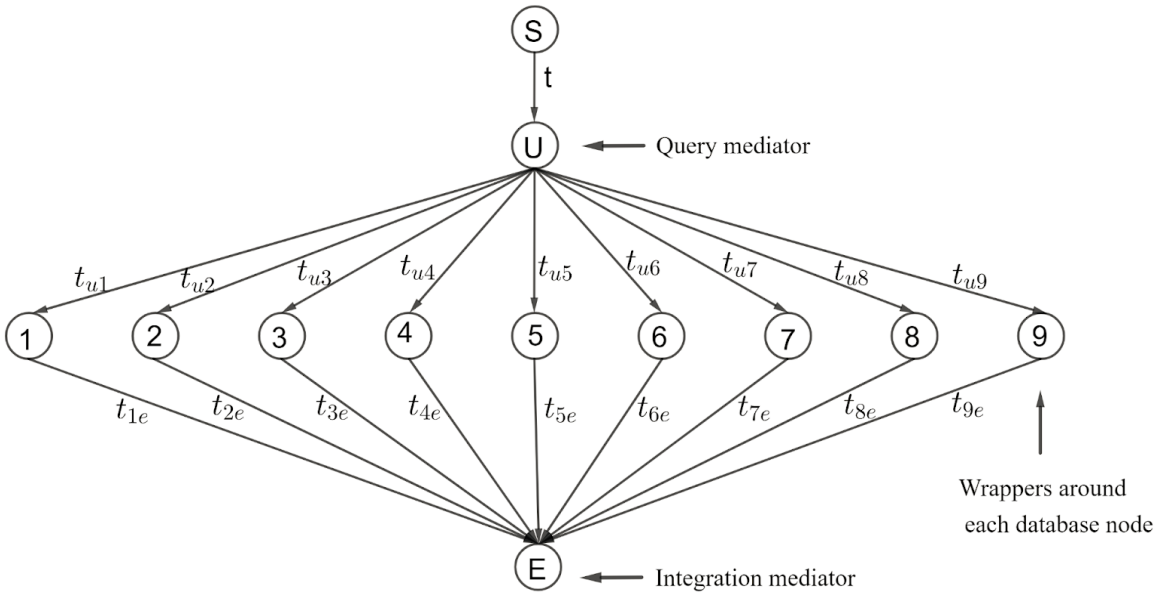


Figure 4. Digraph G_2—the proposed procedure in the presented example.

The vertices of G_1 and G_2 correspond to state administration services and ministries (Appendix A, Table A1), as follows:

0—The Ministry of Interior;
1—The Municipal Body of Local Self-Government;
2—The Municipal Body of Government;
3—The National Health Insurance Fund;
4—The Country Level Tax Administration;
5—The Local Authority Tax Administration;
6—The Pension and Disability Insurance Fund;
7—The Republic Geodetic Authority;
8—The National Employment Office;
9—A Central Register of the Insurance using Obligatory Social Insurance;

S—The beginning of the procedure;
E—The end of the procedure;
U—The user action.

The (oriented) edges of G_1 correspond to the order in which the applicant should visit the state administrative services and municipal bodies to collect the necessary documentation. Precisely, there is an edge from vertex i to vertex j, where $i \neq j$, and $i, j \in \{0, 1, \ldots, 9, S, E\}$, if and only if for obtaining the documentation from the state administration service j, the applicant was supposed to visit the state administration service i first.

The (oriented) edges of G_2 represent the work of the newly proposed smart-government model from the moment the applicant enters the requested data. The current procedure, i.e., the model given by G_1, will be compared with the newly proposed one, presented by G_2, using digraph weights. The weight of a digraph is the sum of the weights of its edges. We will consider the case when the weights represent the time, in milliseconds, required to obtain the necessary data.

The weight of G_1 is equal to

$$w(G_1) = \sum_{i=1}^{2} d_{si} + \sum_{j \in \{0,3,6\}} d_{1j} + \sum_{k \in \{4,5,7\}} d_{2k} + d_{75} + \sum_{l=1}^{9} d_{le} \tag{1}$$

The given weights represent the time in milliseconds needed for collecting necessary documentation. Since the weights d_{si}, for $i = 1, 2$; d_{1j}, for $j \in \{0, 3, 6\}$; d_{2k}, for $k \in \{4, 5, 7\}$; and d_{75} can vary from a few minutes, say 15, to a few days, say 5 days, we will suppose that $d_{si} \approx d_{1j} \approx d_{2k} \approx d_{75} \approx d$, where d is arithmetic meanof these weights, and $d \in \left[9 \cdot 10^5, 4.32 \cdot 10^8\right]$. As the weights d_{le}, for all $l = 1, \ldots, 9$, denote time needed for submitting the final application, when the applicant has already collected the required documentation, we can ignore them, i.e., we will suppose that $\sum\limits_{l=1}^{9} d_{le} = 0$. Therefore, equality (1) becomes

$$w(G_1) \approx 9d \tag{2}$$

This means that we can consider that $w(G_1)$ approximately belongs to the interval $\left[8.1 \cdot 10^6, 3.89 \cdot 10^9\right]$.

The weight of G_2 is equal to

$$w(G_2) = t + \sum_{i=1}^{9} (t_{ui} + t_{ie}) \tag{3}$$

The weight t represents the time the applicant spends in milliseconds entering the requested data. We can assume that $t \in \left[1.8 \cdot 10^5, 9 \cdot 10^5\right]$. The weights t_{ui} and t_{ie}, for $i = 1, \ldots, 9$, represent the time in milliseconds needed for data virtual collection and processing. Since the weights t_{ui}, as well as the weights t_{ie}, for all $i = 1, \ldots, 9$, are very small, in regard to the time spent, we can assume that $t_{ui} \approx t_u$ and $t_{ie} \approx t_e$, for all $i = 1, \ldots, 9$, where $t_u = \max\limits_{1 \leq i \leq 9} t_{ui}$ and $t_e = \max\limits_{1 \leq i \leq 9} t_{ie}$. It holds that $t_u, t_e \in [50, 500]$.

Therefore, equality (3) reduces to

$$w(G_2) \approx t + 9(t_u + t_e) \tag{4}$$

Considering the previous assumptions and observations, we can conclude that $w(G_2)$ approximately belongs to the interval $\left[1.809 \cdot 10^5, 9.09 \cdot 10^5\right]$.

By comparing (2) and (4), i.e., since $w(G_1) \in \left[8.1 \cdot 10^6, 3.89 \cdot 10^9\right]$ and $w(G_2) \in \left[1.809 \cdot 10^5, 9.09 \cdot 10^5\right]$, we obtain $w(G_1) \gg w(G_2)$, which means that the proposed model is significantly cheaper regarding the time spent obtaining the documentation required for applying for child benefits than the existing one.

5. Discussion

The proposed model aims to improve the efficiency of interconnected government services. To validate the proposed model, we have used a child-benefits procedure as a case study, which reflects inefficiency and points to problems in the work of public administration. In many countries, collecting and submitting documents is relegated to citizens. For example, on average, there are some 550 applications for child benefits daily in the Republic of Serbia, or 16,500 applications monthly, including some 12% or 2000 new applicants [7]. Each new user needs at least three days to prepare the certificates, with significant expenses for both applicants and the government (taxes, paper consumption, government labor force, and time waste). The citizens will spend between 7 and 15 days acquiring all of the necessary documents.

This activity occurs during work hours, meaning the citizen must be absent from his/her workplace. According to available data sets of statistical indicators published by the Statistical Office of the Republic of Serbia, Serbia's average hourly labor cost is 3.92 EUR [39]. This means that only the costs of absence from work for eight working hours amount to 31.36 EUR per day or 470.4 EUR per request. An estimate of monthly costs for these purposes goes up to 7,761,600 EUR, including taxes and other expenses. Anything more than insignificant non-material expenses, including office work with applications, decision making, mailing the documents, employee's education, and an applicant's satisfaction, is impossible to estimate.

From the mathematical model, which considers the time required for a user to complete his/her request, and which is described in subsection in Section 4, it becomes easy to identify the key benefits that the model brings to citizens and to the public administration itself. Advantages include faster (timesaving) and better service; increased transparency; increased accuracy; data safety; privacy protection; and financial benefits. We want to emphasize a significant increase in social and population governmental policy effectiveness as a crucial benefit.

6. Conclusions

In the last few years, we have encountered the intensive implementation of ICT technologies in public administrations, which aim to improve interactions with citizens and between the administration bodies. In order to make them more effective, democratic, and transparent, many governments transform their e-government systems into smart governments through the open-data concept. Something more than introducing the open-data concept into the e-government system is needed to solve numerous problems, such as interoperability and data privacy (practical experience has shown that the very concept of open data leads to concerns about the privacy of potential users).

Interoperability between different public authorities within the administration (at all levels) is a significant problem. It requires the upgrading of the e-government system to provide efficient collaboration within public administration. The new information system model proposed in this paper enables easy and safe data transfer among public authorities. Using advanced ICT technology (e.g., database virtualization and mediator-wrapper technology) decouples data processing from data storage and enables collaboration between different databases without additional costs (databases remain in their locations). Further, this model implies building a collaboration layer with numerous service functions (instances). The system can determine which databases store the requested data and enable simultaneous data processing on multiple database nodes. This way, the IGS application can communicate with a single instance, despite multiple database nodes acting over the data. This results in better problem-solving and the optimal utilization of resources.

We have proved the effectiveness of the proposed model by (Di)graph theory in the example of a specific public administration service. We have modeled the current state and compared it with the proposed model. As a measure of similarity, we have used the time required to collect documents (a critical measurement of citizens' service satisfaction).

Testing has shown that the same model can be used elsewhere in public administration without jeopardizing the individual's privacy.

Author Contributions: Ž.B.—Conceptualization, data curation, software, investigation, methodology, and writing—original draft; Đ.K.—resources, project administration, and funding acquisition; P.D.B.—conceptualization, software, methodology, and writing—original draft; I.M.J.—data curation, formal analysis, and validation; J.Š.—investigation, writing—review and editing; and V.Š.—investigation, writing—review and editing. All authors have read and agreed to the published version of the manuscript.

Funding: The research presented in this paper was supported by the European Union's Horizon 2020 research and innovation program under Grant Agreement number 856967 and by grants of the Ministry of Education, Science, and Technological Development of the Republic Serbia (III44003), (III47005).

Institutional Review Board Statement: Not applicable.

Informed Consent Statement: Not applicable.

Data Availability Statement: No additional data is provided.

Conflicts of Interest: The authors declare no conflict of interest.

Appendix A

Table A1. Documents, their locations, and services that the competent institution should provide for the functioning of the child-benefits system (example of Serbia).

Institution	Database	Centralized Database	Required Service	Type of Data
Ministry of Public Administration and Local Self-Government	Registry Books	Existing	Registry Check	Public
Ministry of the Interior	Personal Documents Registry	Existing	Personal Documents Check	Private
National Health Insurance Fund	Health Insurance Registry	Existing	Health Insurance Status Check	Public
Tax Administration	Unified Tax Registry	Existing	Three Months of Income Report	Private
Tax Administration, Local Authority	Property Tax Registry	Non-Existing	Tax Certificate	Private
Pension and Disability Insurance Fund	Registry of Insured Persons	Existing	Three Months of Income Report	Private
Republic Geodetic Authority	Service for Real Estate Cadastre	Existing	Real Estate Certificate for Serbia Cadastre Income	Private

Table A1. *Cont.*

Institution	Database	Centralized Database	Required Service	Type of Data
Nacional Employment office	Unemployed Registry	Existing	Verification of the Status of an Unemployed Person	Public
			Report on the Attained Financial Rights	Public
A Central Register of Insurance using Obligatory Social Insurance	Social Insurance Registry	Existing	Social Insurance Status Check	Public

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