STAGES OF E-GOVERNMENT TECHNOLOGIES
DEVELOPMENT AND IMPLEMENTATION

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The rapid development of information communication technologies and the gain for the private sector from its use put pressure on the public authorities. E-Government seems to be the perfect reply to the demand for better and more efficient services. However, in times of compressed public budgets introducing e-government systems is not that easy. Many of the successfully implemented technologies and techniques in the private sector can not be set one-to-one to public institutions.

This paper briefly discusses the theoretical concept of the steps of the e-government development and implementation, from regulatory and legislation development stages to e-government principles inclusion. The major attention is paid to the main directions of e-government development. They are the base for government introduction of e-government strategies' implementation. The paper concludes by analyzing concepts and theoretical frameworks to reveal the broader context of structural initiatives for E-government development and the recommendations for further studies of the topic.

Implementation stages of e-government vary from country to country. The discrepancies occur when we talk about e-government basic principles, involved agents, and the way of interaction with the public. The discussions about the stages can be found in a variety of documents and articles, among them are [1], [2], [3]. Although these papers belong to the beginning of the XXI century, they are still actual as they represent the theoretical basement of e-government development.

Corresponding to the principles of the rule of law, the governance of a country is conducted through legislation, and all activities, including those of government institutions, should be managed in accordance with the law. Before taking any steps, the government designs e-government frameworks and action plans. Their adoption usually provides the best picture of the desired state of e-government affairs in any given country. It usually indicates the importance the political leadership assigns to the development of e-government and information society. The legal frameworks, including national constitutions and laws, strongly regulate governmental activities to create an auspicious legal environment. Also, with the use of modern IT and communication facilities, electronic public service provision and supply require the
adaptation of laws to make e-Government solutions compulsory. In particular, this refers to the questions of electronic signatures and electronic documentation, data protection, and data security, access to public information, networking of authorities, and databases [4].

Considering the above, a government launches an e-government development strategy, which implies the following implementation stages: (1) establishing a web presence, (2) facilitating a web presence and developing interactions and communications between actors, (3) online services introduction, (4) full-service integration, and (5) e-Democracy.

The first stage establishes a web presence. The most common digital government initiative is to develop a single or a few official government websites that offer information to the user and serve as public affairs tools [5]. Websites on this stage are delivering basic information about services provided by state government authorities.

The second stage facilitates web presence interactions and communications between actors. Various applications, such as emails, social networks, upload forms, and documents stimulate interaction between government and the public (Government-to-Citizen and Government-to-Business) [1]. As information becomes more dynamic the number of government web pages increases. At this stage, local government websites are also developed.

The third stage is online services introduction. The complexity of technology grows, but customer value (G2C and G2B) is also higher. Full transactions can be made without going into the office. Examples of online services are income tax filing, property tax filing, renewal/renewal of licenses, visas and passports, and online voting. Thus, a more formal exchange between a user and a government service provider takes place [2]. At this stage new laws are introduced.

It is important to have relevant regulations in place for e-governance. There is a common misconception that e-governance requires elaborate a lot of legislation. Such a situation may be harmful, which risks creating a parallel system of governance. Only some areas enforce special legislation. They are the recognition of electronic identities and signatures as well as electronic documents. This can be done through special laws or amendments to existing ones. Also, the protection of privacy is essential. It is a constitutional right in most countries all over the world. Usually specific data protection regulation pads the general rules. Though electronic data does not certainly mean increased risks for privacy, the perception that personal freedom, civil and democratic rights are at stake still exists [6].

The government handling of personal data is an important research topic. Governments obtain information from citizens because of their governing functions and often share the cost of submission to them. Thus, the government may lack the incentive to value citizen's information appropriately. Personal data becomes very sensitive. Anonymity is often impossible or even illegal when dealing with the government. At the stage of data aggregation, the analysis of these data can be highly rough [7]. Thus, the issue of balancing e-government development and the need to guarantee individuals' rights emerges. Appropriate personal data protection is vital to maintain public trust in online government and crucial to the success of the e-government itself [8].

Also, the essential part of e-government development is the creation of digital identity. Online services introduction can not be made without properly developed e-identity. The situation of the voting process illustrates the issues very clearly. The identity of a voter must be verified beyond any doubt to make sure that he or she is
legally entitled and correctly registered to vote [6]. Digital identity lets a user of an information system prove themselves unambiguously as a user of the system or an author of a digital document.

The legal e-identity regulation is concerned with identity documents (ID-cards), digital signatures (regarding ID-card certificates), and the population registers. However, the importance of digital identity has not originated yet. In all countries, the most common method of authentication is still the use of the username and password.

Initially, digital identities may be developed for specific services (like taxation or social security). Though having too many different identities causes them less attractive to use. It is possible to use the same identification systems for many services. For example, financial institutions often provide digital identification systems. It presents a good opportunity for public-private partnerships, as the demands for secure identification are similar [9].

The process of identification may include an identity card, that contains machine-readable chips with visible data fields and data fields that may be readable only to particular state officials. However, a real digital identity should be possible to securely use online for different transactions. Cards have a digital identity on a chip - a set of data and software, protected with cryptographic means. Also, the card carries a specific piece of individualized software called the key, which combines PIN and digital signature [9].

Official government website setting is another basic concept to consider. From a technical point of view, government portals are usually divided into the presentation layer and services layer. The first gives visual information, and the second provides application templates, data queries, and submission. For services, it is important to develop a payment gateway that allows governments to receive online application forms together with the payments for the government service fee.

The fourth stage is the full-service integration. It is the case of all information systems integration. The public can receive G2C and G2B services for one (virtual) meter. A single point of contact for all services is the ultimate goal [1]. Various service delivery programs across government agencies and between levels of government require advanced technologies for electronic information sharing and integration [2]. As a consequence, government design plans for blockchain adoption.

Blockchain is a public ledger, in which all transactions are stored in a chain of data packages and distributed across a peer-to-peer network. Its main characteristics are [10]:

- Every node in the decentralized network can validate transactions and has an identical copy of the ledger.
- It is impossible to admit invalid transactions. There is no way to edit, delete or copy transactions that are already recorded.
- To ensure the anonymity interactions between individuals take place with public-key cryptography.
- Auditability. All transactions are stored in chronological order and include both the previous and current transaction block hash.

Realization of Blockchain technology in the context of e-government brings the following benefits: improve the quality and quantity of government services, increase transparency and accessibility of government information, provide transactions’ verification, and develop information-sharing across different organizations. However, information security, charge, and trustworthiness are still major problems in its application. So, developing management standards and establishing the responsibilities are crucial for promoting and applying blockchain in e-government [11].
The fifth stage is interactive democracy, which includes citizen participation with public outreach and a range of accountability activities. In this case, government websites go beyond the model of service delivery and undergo a political transformation. In addition to the built-in and fully-run online services, government sites offer the ability to personalize websites. Online democracy encloses access to elected officials, discussion forums, voter registration, and ultimately online voting. These services intend to supply the community at large.

As can be seen, there are five main stages of e-government development in the country. They include early stages such as communication establishing tools through website development and social networks usage, as well as the implementation of new technologies (Big Data analysis and Blockchain technologies) into the communication between government and various bodies and agents. Further studies of the topic will examine the adoption of e-government model for a particular country to reveal main peculiarities and identify directions for its development.

References:


