

# E-gov 4.0: A Literature Review Towards the new Government

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## ABSTRACT

E-government (E-Gov) has evolved along side Information and Communication Technologies (ICTs) and different models have been developed to understand this field. At the same time web mobile technology (MT) with artificial intelligence (AI) have been improving the services that government agencies (GA) provide to citizens and businesses. The purpose of this poster is to link both trends by a bibliometric study and to suggest a new concept for electronic government (E-Gov 4.0).

## Keywords

E-Gov 4.0, SmartGov, virtual agency, virtual bureaucracy.

## 1. INTRODUCTION

Some authors used meta-analysis for helping their studies and using technology. Some other made a qualitative meta-synthesis for classifying a twelve stage model of E-Gov. Yildiz [1] for example reviewed the limitations of E-Gov literature.

Early work on E-Gov (version 0.0) can be traced in the research of Alan Turing [2] and Virtual Agencies (VA) take the beneficial aspects of the Weberian bureaucracy, seeking more efficiency and improving services [3].

### 1.1 Models of E-Government

E-Gov is a new field of research and several concepts and models have been developed to understand this field: *Technology and Government* [4], *Interoperability*: [5], *Internet Governance* [6][7], *Agency Interactions and Information Exchange* [8][9] and *Other Models*.

### 1.2 Concepts

In the early 80s there is a radical change in the computer age and dependences files begin to be electronic and start the next stage of E-Gov 1.0, some agencies begin being purely informational websites. In the late 90s and with the Internet's boom, the Web 2.0 technology emerges giving way to the use of social networks and dynamic content on web pages allowing direct interaction with the public, appearing two new concepts: VA and virtual bureaucracy [3]. Regarding the MT emerges in the late 2010 and the Web supported the construction of E-Gov 3.0.

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In accordance with Ndou the main stakeholders in E-Gov are: citizens, businesses, governments and employees [10] and E-Gov is used to provide various services to citizens, but does not increase their participation in decisions. Furthermore Moon [11] argues that E-Gov may be closely related to the level of democracy in a society (E-democracy).

## 2. METHODOLOGY

For the purpose of this research is used the documentary method where we conducted the review of 241 papers related to E-Gov topics. The selection process consisted of: (1) search in the journals about the evolution of E-Gov, (2) once we decided the type of journals, choosing each article considering the title (3) filtrating the abstract with relevant themes, (4) only 241 titles were selected from hundreds of found sources (Springer, ACM, IEEE, etc.).

### 2.1 Method

The E-Gov papers were selected focus in finding specific concepts related to the ICTs and services for citizens related to economic, administrative and computing topics. Selected papers were discriminated in a first place according to the objective of this work: suggest a definition towards E-Gov 4.0 or to substantiate it.

Then we collected concepts from different authors that define E-Gov from 2000 to 2012, showing various trends in their definitions, models and finding similarities among them. Another reviewed variable was the evolution and the progress based on technology that directly affects the implementation of new forms of E-Gov.

Finally, and having seen the trend of ICTs, the different stages of the Web and the influence and advances in the AI area, we achieved an idea of the E-Gov of the future.

Regarding these sources (figure 1), 61% were taken from journals, 25% from books, 8% from platforms and 6% from organizations. Books are important in research but journals have the newest ideas and trends.

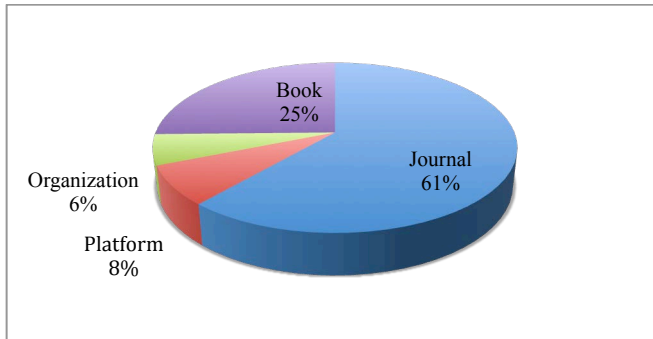
## 3. TOWARDS E-GOV 4.0 CONCEPTUALIZATION

The evolution of E-Gov until recently. It is expected that future governments move towards "E-Gov 3.0" which is viewed as a smart government, using the technology of the Semantic Web, a new generation of smart grid thinking by itself based on AI that customizes all utilities depending on conditions and preferences of each individual [12].

There is research about web 3.0 since 2007 and this may be useful in shaping the development of E-Gov 3.0. In this way, thinking about an E-Gov 4.0's definition or SmartGov [13] use of sophisticated ICTs is highlighted. Meanwhile Scholl [14] talks

about engaging citizens. Also Gil Garcia and Luna Reyes [15] mention the improved use of information and the development of information society and knowledge.

**Figure 1. Type of Sources**



Assisted by supported processing equipment with high evolutionary computation techniques, VA will be transformed, allowing an easier interaction between government agencies, citizens and businesses by means of MT and quick internet access, the service will be 24/7 and ubiquitous: **Intelligent Virtual Agency (IVA)** will allow the performance of any procedure at any time at any place, helping bureaucracy to eliminate its bad practices. AI techniques [16] help virtual assistants to interact with citizens [17] and obtaining the required towards an IVA.

The conceptualization of E-Gov 4.0 will be helped by Web 4.0, ubiquitous Internet Technology, fully mobile, ultra-fast and 3D; virtual will be fully integrated into the real world. Information processing will reach a similar level as the human brain [18], adding more accuracy and avoiding common human mistakes, supported by nanotechnology and superconducting materials like grapheme, mobile devices will be smaller than a watch, in addition they will be affordable at a low cost [19]. E-Gov will then really be smart and will make government-user interaction more efficient and effective, facilitating and enhancing the experience in obtaining services, increasing citizen participation in the public decision making policy.

As we can see, the evolution of E-government depends directly on the evolution of technology and the needs of the citizens. The trend for government services is to have an integral and IVA, where all the services will be implemented.

#### 4. FUTURE RESEARCH

Its is important to make a literature review of SmartGov and its definitions, tends and technology used, establishing the relation between different models of E-Gov evolution and E-Gov 4.0, and its features for comparative studies in order to find what government agencies are missing to reach this stage.

Within the performed studies, sampling has to be done in order to find the relation among corruption, transparency and efficiency in the use of the E-Gov.

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