Chapter 3
The Inherent Difficulties and Complexities of Voting Electronically:
An Overview

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ABSTRACT

Countries worldwide have been conducting trials and holding pilots to evaluate the benefits and detriments of introducing electronic voting; while some have successfully implemented state of the art voting solutions, others have decided to abandon such attempts altogether. Across the field, one can see a multitude of different approaches, revealing the wide diversification of political cultures, legal regulations, social requirements, and contexts, within which this technology must be deployed. The approaches adopted can thus seem to be contradictory or indeed diametrically opposed. The purpose of this chapter is thus twofold. Firstly, it attempts to provide an introduction to the field of electronic voting while reviewing the most recent advances and related literature. Secondly, it attempts to evaluate under a perspicacious vision the level of maturity of the technology.

INTRODUCTION

Since the publication of "the nerves of government" in 1963 (Deutsch, 1993; 1963), Information and Communication Technologies (ICT) have been considered vital for political systems. ICT has been recognized as having tremendous administrative "potential (Yildiz, 2007; 2007,

creating a networked structure for interconnectivity (McClure & Bertot, 2000), service delivery (Bekkers & Zouridis, 1999), efficiency, effectiveness (Heeks, 2001a), interactivity (DiCaterino & Pardo, 1996), accountability, transparency and decentralization" (La Porte, Jong, & Demchak, 1999). This is commonly referred to as electronic government (e-government), a process of enabling

a broad range of citizens to access governmental information and services, as well as to participate (e-participation) in government decision-making processes via ICT (Wimmer, Traunmüller, Grönlund, & Andersen, 2005; Ghere & Young, 1998; Heeks, 2001b). E-government utilizes the Internet and the world wide Web for delivering government information and services to citizens (UN & ASPA, 2001), but also refers to using tools such as "database, discussion support, multimedia, automation and personal identification technologies" (Jaeger, 2003).

Over these years, numerous information policies and instruments have made electronic governments a global reality. Wolfgang Schäuble, when serving as Germanys Minister of Interior, stated that "every policy initiative sooner or later becomes an ICT project."(Schäuble, 2007)} Since their initial introduction, electronic government services have been continuously maturing, evolving in availability and sophistication. E-governments have progressed from an "initial online presence, through a limited number of individual governmental pages" towards a "totally integrated presence, which has the ability to cross departments and layers of government" (Capgemini, 2009). In Europe availability of government services online rose to 82% in 2010, a strong increase from 69% in 2009, while in terms of sophistication (sophistication assesses the degree of interaction between service provider and user) Europe stands at 90%, an increase of 7% since 2009(Capgemini, 2009 ; Capgemini, 2010). Most popular eGovernment services include: 'declaring income taxes' (73% of users will use the eChannel for this service next time), 'moving/changing address' (57%), and 'enrolling in higher education and/or applying for a student grant' (56%) (Capgemini, 2013). Least popular eGovernment services include: 'reporting a crime' (41% of users will use the eChannel for this service next time), 'starting a new job' (41%) and 'starting a procedure for disability allowance' (42%). Overall though, citizens show a wide adoption of available electronic government solutions.

VOTING TECHNOLOGIES

In a democracy, the most vital citizen participation process is voting, as it can inherently facilitate the expression of the general will and unify citizens into a single body. Government's across the globe have been exploring methods to digitalize this process, as a way to deal with declining election turnout and political apathy, but also speed up the process, reduce costs and increase tally accuracy. This is far from a straight forward task, as voters in democracies around the world currently cast their vote in one of a variety of ways. Hence, elections differ from nation to nation, not only with respect to the technology chosen to determine the elected candidates (e.g., proportional, majoritarian), but also in respect to the procedures, the way in which votes can be cast, the organizations involved, etc. (Weldemariam, 2010).

The voting method we are most accustomed to today is referred to as the Australian secret ballot. In its basic form, a voter is provided with a piece of paper on which his vote is noted. His vote is then sealed inside an envelope and cast into a public ballot box, to be opened at the end of the election for tally. An election conducted using the Australian secret ballot can only be considered trustworthy, if every ballot is strictly accounted for and no blank ballots escape the control of the election officials. The greatest weakness in this scheme lies in the way that votes are counted. Tally teams must include representatives of opposing parties to ensure that the votes are counted appropriately. The process of calculating the final tally is time consuming and exceptionally vulnerable to human errors.

As early as the 1950s, optical mark-sense voting systems were used to automate the entrance examinations to the ACT College; soon later the systems applicability to elections was explored. Voters would mark paper ballots by hand or by using a ballot marking device, then the ballots would be stored in a locked ballot box and run through a scanning device to calculate the result

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