Total cost formula
for e-voting implementation

Iuliia Krivonosova
PhD student, Junior Research Fellow
Ragnar Nurkse Department of Innovation and Governance, TTU
Supervisors: Dr. Robert Krimmer, Dr. David Duenas i Cid
Why do we need to know how much e-voting costs?

- demand from governments and the advocacy groups;
- cases of “discontinued use”: the Netherlands, Switzerland (Svensson & Leenes, 2003), the USA;
- demand from the citizen side (how much it costs to a budget, and whether the spending could be optimized):
  a) cost control (hidden costs);
  b) transparency.

“There is no sufficient breakdown of costs in the public domain”, The Institute for Digital Democracy, UK.
Broader context

- Discourse: “government does not sell their services” (Brown, Myring, and Gard, 1999)
- Candidates’ spending/campaign costs; cost for a voter (Down, 1957; Haspel, & Knotts, 2005; Niemi, 1976; Colomer, 1991) VS administrative costs of elections
- Despite all development, elections are getting more and more expensive (inflation considered) (Montjoy, 2010)

“If there is one thing that is particularly hard to pin down, though, it’s the question of how much running an election costs”, NCSL, USA.
Previous research

1. **California Association of Clerks and Elected Officials (CACEO) Election Costs Study**: cost comparison across California, “provide transparency”.
   - Direct Cost Categories, detailing costs associated with staff Salaries and Services & Supplies, Election Technology survey to record hardware and software purchased
   - election administrators tracked the costs

2. **The Cost of Registration and Elections (CORE) Project**
   - budgets of Electoral Management Bodies (EMB’s)

Findings:
- the type of democracy environment (i.e. stable, transitional and post-conflict) matters

3. Multichannel voting cost comparison
Theoretical framework

- No consensus whether implementation of i-voting reduces costs of holding elections (Qadah & Taha, 2007; Stoica, & Ghilic-Micu, 2016) or, to the contrary, is not cost-effective (Svensson & Leenes, 2003);
- Activity-Based Costing – ABC (Cooper, & Kaplan, 1992; Brown, Myring, & Gard, 1999);
- “Bathtub curve”
- Technology diffusion: 3 electoral cycles (Solvak and Vassil, 2016)
“Bathtub curve”

Source: CMU (ECE) - Carnegie Mellon University
ABC – not volume-driven accounting methodology

Volume VS Activities

“Activities have cause-effect relationship with cost incurrence” (Brown, Myring, & Gard, 1999: 7-8)

Traditional ABC: the employees are asked to fill the form on how much working time they spend on every particular activity

Cost driver - the frequency of events/actions instead of their volume. How many times the process was triggered?
Research Questions

- How much remote e-voting costs?
- How implementation of the Internet voting impacts overall costs of election?
Structure

I. General costs of remote e-voting implementation
   - political, social, legal and technological implications of e-voting implementation in (Krimmer and Schuste, 2008);
   - identify processes;
   - a formula of expenses (per voter; per year);
   - the range of costs for every element.

II. Test the formula on the case of Estonia
   - identify more cost-effective options;
   - identify hidden costs.

III. Side effect: the menu of different options and models of e-voting implementation
Processes of remote e-voting (I)

“Process - a series of actions or steps taken in order to achieve a particular end”, Oxford Dictionary

- Reaching consensus (scales of i-voting, time period, primacy of a paper vote)
- Passing the relevant legislation
- Assessing infrastructure in order to understand how it can be used for i-voting
- Security and technical analysis – developing the adversary model
- Developing/ buying the Internet-voting system
Processes of remote e-voting (II)

- Developing/buying the voter identification system
- Developing/buying the voter application
- Developing/buying the vote verification mechanism
- Training the EMBs
- Educating voters
- Testing of the voting system and voting application – mock election
- Applying at the elections
- Audit of the e-voting system during the election
- Making updates/changes to the system
Prepare the relevant legislation

Assessing infrastructure

Security and technical analysis (adversary model)

the Internet-voting system

Voter identification system

Voter application

Vote verification mechanism

Educating voters

Training EMBs

Testing of the voting system and voting application – mock election

Applying at the elections

Auditing the e-voting system during the election

Making updates/changes to the system
Case-study: Estonia

- Comparisons of costs over a long time-period
- Utilize from existing infrastructure (decrease the costs VS impose new costs on the existing infrastructure)
- Tough election schedule
Internet Voting as Additional Channel for Legally Binding Elections: Challenges to Voting Processes Re-engineering

- why such offerings are being undertaken and how they influence and change the voting process and governance thereof, as well as how the adding/removing of Internet voting and other channels impacts overall costs thereof.
Case-study: Estonia

- identify processes and activities (N of people, time, cost driver);
- allocate costs;
- compare the costs;
- legislation analysis, process modeling, budget analysis; election observations, interviews with EMBs and NEC.
References

- California Association of Clerks and Elected Officials (CACEO) Election Costs Study. URL: http://results.caceoelectioncosts.org/#/about
Discussion

luliia.krivonosova@ttu.ee

www.linkedin.com/in/krivonosova

https://www.researchgate.net/profile/Luliia_Krivonosova