E-VOTING AS AN ENABLER FOR PUBLIC SERVICE INNOVATION FOR CREATING TRUST AND POLITICAL COHESION

Research Agenda for e-Voting Development

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Abstract

In our paper we present a research framework, how the concept of e-voting, as a complex info-communication technology (ICT) innovation can potentially create social trust on an institutional level and political cohesion on a national level. In the centre of our argument will be the observation that the fluid borders between citizenship and nationality combined with mobility of inhabitants increase the demand for innovative voting solution supporting national elections. We propose five directions for e-Voting development in the Hungarian and broader CEE context based on a conceptual review of the topic and some empirical data and observation. Also by developing this multifaceted research agenda we may find useful theoretical contribution to the field of e-democracy in general.

Firstly, we identified the "virtual nationality" concept in the CEE region both in the EU context and in trans-national settings. Secondly, we recommend that building e-Voting programmes on comprehensive cybersecurity foundations also enhances institutional trust especially in the technical mechanisms of the electronic voting processes. Thirdly, we argue that creating and enhancing e-Government solutions gradually increase participation which increases willingness to technology adoption. Fourthly, with the illustration of sociological research amongst youth in Europe and Hungary we proposed an intensive stream of constructivist inquiry how trust can be built in democratic institutions via technology and how electoral organizations can be won to embrace the idea of e-Voting initiations. Finally, the fifth research stream in our agenda proposition is the R+D necessity of e-Voting in controlled and gradually extended environments.

Introduction

Hungary is not in the front line of e-Voting initiatives, nor is involved in wide scale e-participation experiments and initiatives. On the contrary, strategic focus of e-Government developments are placed on the integrative vision of ICT applications (Bannister & Connolly, 2012) such as simplification, interoperability, portal development, one-stop-shop, and electronic services (Aranyossy, Fekó, & Nemeslaki, 2014). ICT applications in the area of enhancing the governance dimension are not in the mainstream of agenda, and in this paper we intend to argue why it should.

The motivation for our initiative originates from the practical opportunity of the new planning horizon of the 2014-2020 EU operative and cohesion fund cycle, the need for governance reforms generally in EU but specifically in the CEE countries, and finally to enrich the theoretical frameworks of understanding the drivers and barriers of e-democracy and particularly e-voting in CEE.

Our paper has the following structure: in the first section we provide a brief overview of e-Voting, and the state of the art of its applications and inhibitors. Given the fact, that there is a wide range of literature on the surprisingly few experiments and implemented solutions of e-Voting we keep this section short. Then we systematically develop a research framework which we propose to examine the situation in Hungary and in CEE entailing five drivers of e-Voting.

Conceptual background of e-Voting

E-Voting is generally seen as any type of voting that involves electronic means. Although e-Voting can be conceived in many different ways, a crucial distinction may be made between electronic machine voting (eMV) and electronic distance voting (eDV). eMV simply refers to the use of any electronic apparatus to record and count votes in a fixed public place. eDV goes a step further in the sense that it implies the electronic registration, culling and counting of votes cast from different locations. It typically allows the voter to use a more generic technology such as interactive digital TV, telephone, Short Message Service (SMS) or the Internet, to cast his vote from any preferred place (Svensson & Leenes, 2003).

In this context we consider that e-Voting entails a complex relationship between technology and society (Lee, 2004). E-Voting systems are not composed of technology alone; they are systems which emerge from the mutually transformational interactions between the information technology and society. The duality of this relationship is essential for understanding how innovation is enabled by ICT, because information systems are as much the result of ICT enabling society, as much as society enables information systems (Orlikowski, 1992). Furthermore, both the economic value (Brynjolfsson & Saunders, 2010) and the broader social value (Bannister & Remenyi, 2003) of such systems depend on how successfully this duality works, and how ICTs and society create new institutionalised socio-technical systems, (Bannister & Connolly, 2012), (Lips, 2012).

We take the starting point that the design of e-voting system must take the solid basis of security and trustworthiness, and go beyond to understanding voting as a fundamentally social process. As a recent study found, banner messages on a social network about friends who had voted in government elections drove more than 340,000 people to vote. Moreover, studies have indicated that social stimuli can positively affect the quality of decisions made (Vlachokyriakos, Dunphy, Taylor, Comber, & Olivier, 2013).

Prosser and Krimmer has introduced a specific framework for e-Voting research extending this duality of technology concept by arguing to position the field in the intersection of politics, law, technology and society (Prosser & Krimmer, 2004).

In the field of politics, they draw the attention on the nature of political system itself, the method and frequency of elections (including the statistics and reporting structure of the mechanics of elections), and the official attitude towards e-Voting. This covers not only the policy making and its process, but with a crucial importance, the structure and the position of the official organization being responsible for elections (in the case of Hungary this would be the National Election Committee). In a recent study about the e-Voting experiment in Brazil, Chrisanthi Avgerou goes even further, concluding that political efforts in the entanglement of e-Voting systems reflect and serve purposes of maintaining trust in democratic elections (Avgerou, 2013). Also, connecting to Prosser and Krimmer´s political dimension, she highlights the pivotal role of the organization bearing the responsibility for conducting elections in a country.

Secondly, the reflection of a government´s attitude towards democratic elections is concretely materialized in the legal system which provides the environment of voting. Naturally, in the centre of this is the electoral law, but we should not forget other legal instruments, acts, bylaws, government decrees etc. which determine the broader legal environment and attitude of institutions toward citizens´ participation, institutional modernization and organizational innovation.

In the third, technology dimension Prosser and Krimmer suggest that e-Voting capabilities in a country are very much determined by broader experiences with public ICT implementations. For instance, they refer to status of registers, the implementation of electronic ID cards, the status of digital signature, and naturally the quality and reliability of the general telecommunication and ICT infrastructure (Prosser & Krimmer, 2004). Availability of technology in terms of access, price, and quality are crucial factors, including already existing applications and services in e-Government. Avgerou´s findings in the Brazil case nicely connect to these arguments by linking technology to the formation of general public attitude towards ICT use and adoption, which leads to the fourth dimension of e-Voting (Avgerou, 2013).

Lastly, the fourth key area of e-Voting implementation is how some of the related social factors are addressed or, as another view to the issue, how much these inhibit the efforts of ICT use in the elections process. An essential bridge between ICT and society is the aforementioned attitude and inclusion of technology use; let that be e-commerce, e-government or simply personal applications. Going further into the social structures which

might determine acceptance of e-Voting Prosser and Krimmer refers to the level of political participation, turnout in postal voting and desire to vote in general. If we take this chain of thought further, we could take general trust in voting, voting institutions, and finally democracy which embraces all of these terms.

As we show in the following sections, e-Voting is rather a potential with several risks involved in Central and Eastern Europe then a reality in the near future. Informative attempts, though, have been made in Hungary to explore some of the technology solutions and experimental results, such as the most established system in Estonia, the experiments is Germany, Portugal, France or Romania during a two day workshop (Zubor, 2008). When we look at this workshop summary, we have the impression the e-Voting and e-participation in general is treated as a rather distant and fictitious technology experiment, with not much relevance in Hungary. Based on the presentations of this seminar, on empirical data and on the connected literature of e-Voting we present arguments that this fictitious future can be brought closer to reality by developing a research scheme which is not only useful for democracy development in CEE but also offers theoretical contribution to the field of e-democracy in general.

Creating "virtual nationality": e-Voting as an enabler

The first dimension of our research proposition for e-Voting is the assessment of the desire to vote dimension in two virtual situations – somewhat less addressed fields in CEE. The first is to get insights form EU citizenship and its implication on voting, and the second is how opportunities of expatriate or out-of-country voting might enhance the impetus on e-Voting.

The desire to vote issue: EU and Hungarian parliamentary elections

In Figure 1. Figure we show the trends of participation in EU elections on average, and in Hungary. We look at data from 2004 since Hungary´s first voting happened after the major EU extension in 2004. It is important to note, that this extension had caused a major decline in voting participation, in 1979 during the first EU (EU-9) parliamentary elections participation was at the level of 62% which gradually dropped to the 45% (EU-25) in 2004. It is important to note, however, that while EU average participation is stabilized on the 41-42% range, in Hungary we observe a steady decline leaving only a few EU members behind Hungarian citizens´ desire to vote in EU parliamentary elections (Croatia – 25,2%, Poland – 23%, Czech Republic – 18% and Slovakia – 13%).
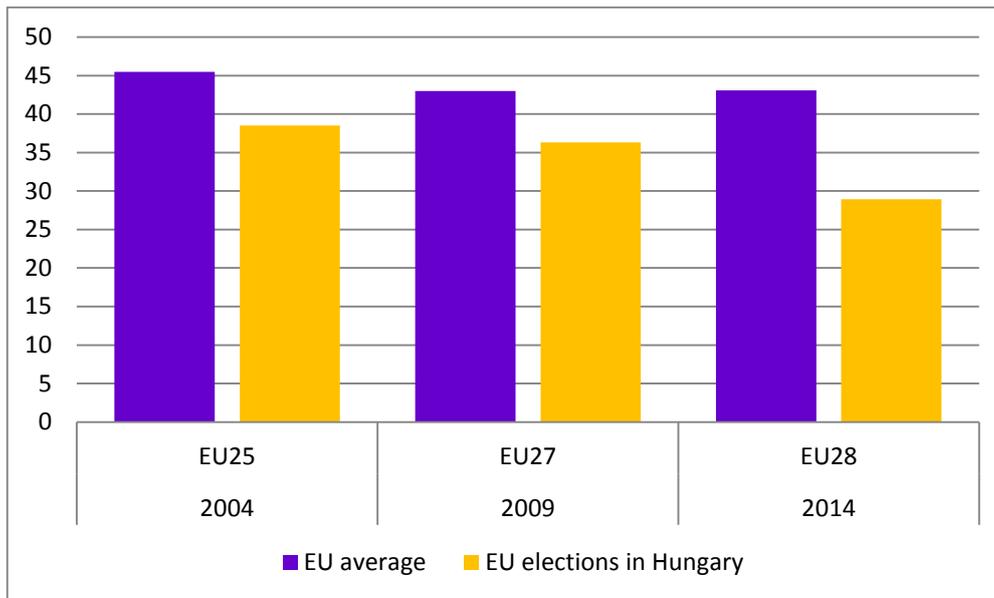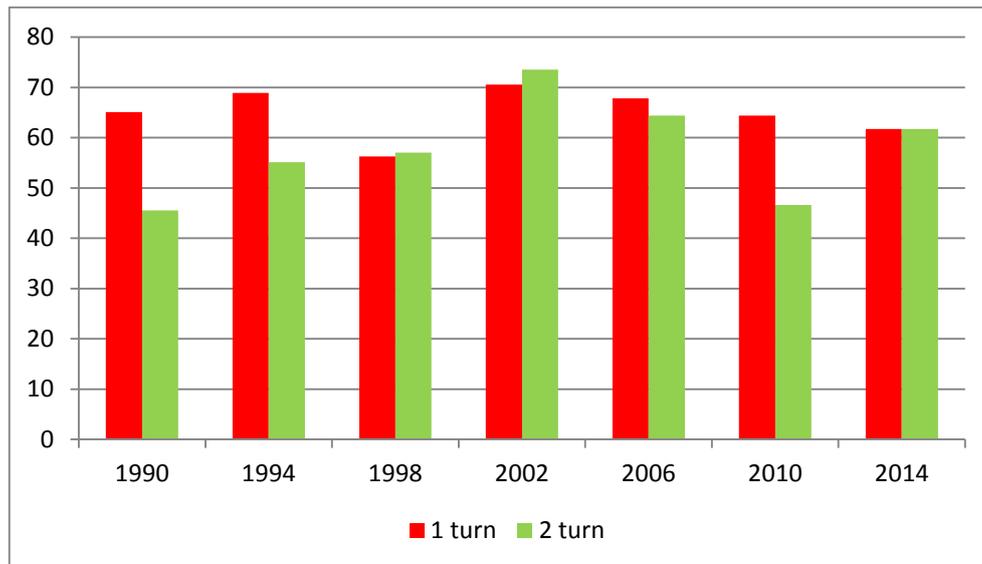
1. Figure. Participation in EU elections. EU average compared to participation in Hungary

Although experts debate weather this trend is continuing or not, the Eurobarometer Research ordered by the EU Commission indicated that in the age group of 15-30 years 64% would participate in the voting, 28% with certainty, and the rest with some level of probability (Eurobarometer, 2013).

In the explanation of the results, analysts argue that young generation of citizens usually participate in voting to a lesser extent than their parents, and they are less and less satisfied how European politics is working. Contrary to this, amongst youth – less than 30 years of age – there is a relatively higher desire to participate, which according to Brussels means they want a higher say in how Europe is working. In Hungary, however, 57% of young people said they have interest in voting at the EU elections, 22% of them would vote with certainty. From the 42% who reported to stay away from voting 15% indicated this with certainty compared to the EU average of 11%.

Amongst the non-interested voters 67% argued that they voting would not mean any significance to the results which is in alignment with the EU-average of 64%. 56% compared to the EU-average 47% is simply not interested in politics, and 48% does not feel equipped well enough to make responsible decision (EU-average 61%). The seriousness of this latter self-reflection is somewhat confirmed by replying to the test question – Is it true that EP representatives are directly elected by citizens? – 56% of Hungarians replied correctly while 47% of youth in EU-average did the same (Eurobarometer, 2013).

One might say, that EU parliamentary elections are so far away from citizens´ real life problems, that intention to vote, and real trust in democratic participation is much relevantly assessed by national elections. In Hungary´s case we speak about democratic elections since 1990 and we summarize the results in Figure 2. Figure

2. Figure. Participation in Hungarian Parliamentary Elections

Until 2014, Hungary had a two-turn election system, which has been changed during the second Orban-government into a one-turn system; therefore data in 2014 indicates participation only on that one occasion in April 6. 2014. When we compare this to the previous first turn participations, we see that there is a steady decline during the last 4 elections, when we – on the other hand – compare the 2014 results to the second turns; we observe a high election turn-out. It is important to note, that second turns had been relevant three times in deciding party majority in the Hungarian parliament – 1998, 2002 and 2006 – and all the three occasions voting participation was very close to the first round participation. When it had not much stake, Hungarian voters stayed away from the second appearance at the voting booths.

A unique driver for voting: out-of country and expatriate voting

In our proposed research framework for e-Voting capability building we consider the issue of out-of-country and/or expatriate voting an essential opportunity and driving force. Presently, the key technology to involve out-of-country citizens in participating national elections is via postal voting or personal appearance in foreign representations, consulates.

This area of national election policy is in the centre of our argument in the case of Hungary for two reasons. Firstly, because the 5 million Hungarians living outside of the borders of Hungary - 50% of them basically in neighbouring countries (Slovakia, Ukraine, Romania, Serbia, Croatia, Slovenia and Austria) – are key focus of national policy especially in providing transparent, non-discriminative and legally satisfactory mechanisms for voting. Secondly, this political strategy might be offsetting the in-country "sceptism" on election participation and also might serve as a test-bed for modernization of electoral institutions in Hungary.

As a starting point, in Table 1. Table we show the results of the 2014 Hungarian parliamentary elections indicating the magnitude and significance of postal voting. The 127 633 valid votes arrived by mail took up 2.7% of in-country and personal votes (some of this where casted at

foreign representations) with 95% supporting the FIDESZ-KDNP coalition resulting in one mandate in the parliament, tilting the leading coalition into two-third majority for the 2014-2018 period.

1. Table. Results of the 2014 Hungarian Parliamentary Elections – indicating the relevance of out-of-country voting

Parties	Regular votes		Postal voting		Cumulative Results	
	Votes	%	Votes	%	Votes	%
FIDESZ-KDNP	2 142 142	43.55 %	122 638	95.49 %	2 264 780	44.87 %
MSZP-EGYÜTT-DK-PM-MLP	1 289 311	26.21 %	1 495	1.16 %	1 290 806	25.57 %
JOBBIK	1 017 550	20.69 %	2 926	2.28 %	1 020 476	20.22 %
LMP	268 840	5.47 %	574	0.45 %	269 414	5.34 %
SUM	4 717 843		127 633		4 845 476	

We get an even more interesting picture of the relevance of out-of-country voting when we take the total number of postal votes arrived to the National Election Committee in Hungary, which was 158.000 votes. When we compare this number with the valid close to 128.000 postal votes, we see that around 30.000 Hungarian citizens – almost 20%! – casted invalid votes or committed an error in the postal voting procedure. The registry of non-country voters at the time of writing this manuscript is at 244.000 citizens in several countries around the world, so this "success rate" of valid voting is not very promising for the future. These set of numbers in our opinion are key arguments to explore more reliable, innovative and citizen friendly voting systems – why not e-Voting?

Remote voting is not only a Hungarian issue, by looking at some other relevant data in this context; we see political opportunity at other countries as well. In Table 2. Tablewe collected five EU countries comparison with Hungary, to illustrate the significance of the "virtual citizenship" stream of research in voting capability building. In some of the countries we have found published results of testing e-Voting solutions (France and Portugal), and two others reported research endeavours (Italy and Romania).

2. Table. Remote or out-of-country voting in some European countries (Kucsera, 2011)

Countries	Inhabitants millions	Outside borders millions	Externally elected representatives	Voting	e-voting
France	66	2,5	12 senators, 11 representatives	postal	tested
Portugal	10,5	5	4 representatives	postal	tested
Italy	61	4,2	6 senators, 12 representatives	postal	researched
Croatia	4,3	1,7	3 representatives	personal	-
Romania	20	1,5	2 senators, 4 representatives	personal	researched
Hungary	9,8	5	1 mandate	postal	-

With further exploration and agenda setting in this research direction we intend to gain higher impetus for e-Voting implementation in the political dimensions and stakeholder support.

Creating security awareness: foundation of e-Voting

In the technical dimensions one of the ultimate key success factors of e-Voting implementation is security. This entails cryptographic coding of votes, secure identifications, reliable data transfer and many more technical details for maintaining trust in voters, electoral institutions and political parties. The main problem, which we intend to turn into an opportunity in this second research area, is that security issues have become systemic, social and highly impacting legal establishments in the area of government operations. Protecting electronic data assets and critical information infrastructure has become a crucial issue worldwide.

In this section we develop arguments that e-Voting capability can be built from developing the interdisciplinary concepts and solutions of information security, especially when they provide a comprehensive approach for treating ICT management in the public sectors. Using Hungary´s case this proposition might serve as a driver for e-Voting.

The more developed e-Government systems we have and the more activities are conducted in the "cyberspace", the more exposed they are to high level of risks: attack against multiple systems or against a full infrastructure. This can take part of a conventional crime, as cybercrime or may be an unconventional event, called cyberterrorist attack. The term "cyberspace" emphasizes the close relationship between "complex networks", relationships between individuals, institutions, ICT, and social networks; in contrast to the earlier concept of "computer network" which has had a primarily a technical meaning. According to Benjamin Netanyahu "Terrorism is the deliberate and systematic murder, maiming, and menacing of the innocent to inspire fear for political ends." (Netanjahu, 1995, p.: 20). The U.S. Federal Bureau of Investigation defines cyberterrorism is any "premeditated, politically motivated attack against information, computer systems, computer programs, and data which results in violence against non-combatant targets by sub-national groups or clandestine agents." (Tiefenbrun, 2002)

As Krasznay and Török writes governments shall maintain countermeasures against the following cyberthreats (Krasznay & Török, 2014):

- *Cybercrime*: organized crime which is deeply involved in the cyberspace. Cybercrime acts can have negative side effects to all governmental institutes and public servants. These types of crimes can be intertwined with other cyberthreats as well.
- *Cyberterrorism/hacktivism*: Hacktivist activities usually target governmental institutes. Cyberterrorists use the same toolset as hacktivists do with very similar goals. That is why governments shall handle both issues with similar countermeasures.

- *Cyberespionage*: When most of our information is handled electronically, intelligence services start focusing more intensively on cyberspace. All governments shall count on this threat and try to prevent data leaks.
- *Cyberwarfare*: Cyberspace is the new battlefield and in this battlefield governmental IT is a major target. In some extreme situations governments shall pay extremely high attention to this new "coding warfare".

Since 2012, Hungary has been building a systematic strategy, legal codification and awareness campaign in the area of cyber security, which might be used as a trust-building technical foundation for further e-Government development, such as e-Voting (Szádeczky, 2014).

Government Decision no. 1035/2012 (II.21.) on Hungary's National Security Strategy requires the strengthening of the security of electronic information systems to enhance the protection of critical national information infrastructure, and the development of adequate cyber defence. Stemming from this statement of the National Security Strategy, the Government adopted a National Cyber Security Strategy of Hungary as well. The legislator took the view that recently experienced cyber wars worldwide justify the coding of a modern Hungarian Information Security Act and on 25th April 2013 was a significant milestone for the administrative control of information, when Act L of 2013 on electronic security of state and local government organizations was published.

The scope of the act is significantly wider as it seems to be, mainly because of the following extensions: data processors of national data assets, European critical infrastructure system elements, and national critical infrastructure system elements, as defined by law. These bodies can significantly extend the scope of the law (even to the field of private companies), so typically the public utility providers, electronic communications services, financial organizations could be included as well. The law prescribes the essential items known as CIA triad in information security field: confidentiality, integrity and availability as information security requirements in electronic information systems and data.

The Act requires the integrity and the availability of information systems in a closed, complete, consistent way, proportionate to the risks for the electronic system and components.

In order to protect electronic information systems and data, proportionally to the risks, the Act states that the electronic information systems must be allocated to particular security classes. This classification is based on confidentiality, integrity and availability properties in a scale of 1 to 5 where 5 is the highest security level.

- Level 1: no organizations (no requirements at this level)

- Level 2: Office of the President, Office of the National Assembly, the Constitutional Court 's Office, Office of the Commissioner for Fundamental Rights, local and national self-governmental bodies, the administrative authority associations

- Level 3: central state administration bodies, the National Judicial Office, courts, prosecutors' offices, the State Audit Office, National Bank of Hungary, the capital city and county government offices

- Level 4: Hungarian Defence Forces

- Level 5: data processors of national data assets, European critical infrastructure system elements, national critical infrastructure system elements, as defined by law

The head of each of these organizations is obliged to appoint a person in charge of the electronic information system security, who is responsible for tasks related to the protection of electronic information systems. The list of tasks includes responsibilities of a conventional chief information security officer (CISO). The Act set up the National Electronic Information Security Authority under the Ministry of National Development, and as a specialized authority, National Security Authority is involved in their activities with forensic log analysis and vulnerability testing.

In our proposed research framework, this more and more widely accepted information security legal framework and awareness momentum plays the second driver to develop e-Voting experiments.

Creating e-Government: from e-Participation to e-Voting

For developing the third stream of drivers to develop our research agenda for e-Voting we refer to the findings articulated by several authors in the field that e-Voting capabilities in a country are very much determined by broader experiences with public ICT implementations, particularly emphasized by (Avgerou, 2013) and (Prosser & Krimmer, 2004).

In order to compare the ICT adoption situation in Hungary compared to other countries relevant from external voting point of view, we collected the most recent data on e-Government usage and development in Table 3. Table The first eight countries are Hungary´s neighbourghs and the others are ranked in order of the number of external voters registered in the particular country. With this ranking we intended to consider, that citizens behaviour and attitude toward e-Government is determined by their living environment, so we might expect more positive adoption behaviour in higher ranked countries, no matter how developed Hungary is in this respect. For instance, in Table 3. Table we can observe that Hungary has higher ranking than its neighbourghs with the exemption of Austria, but has a definite lag behind non-neighbourgh EU and non-EU countries which might create tensions in citizens' behaviour using e-Voting technologies. It is especially interesting if we look at the e-Participation Index in Table 3. Table where we see an even more diverse picture.

3. Table. Adoption of Public ICT and e-Government in Hungary and other countries significant from out-of-country voting perspectives (UNPAN, 2014)

	Country Name	Registered external voters	E-Government Rank		E-Government Index		E-Participation Index		Online Service Index		Human Capital Index		Telecom. Infrastructure Index	
	Hungary		39		0,66374		0,45098		0,55905		0,8668		0,56536	
1	Romania	103654	64	-25	0,56315	-0,10059	0,47058	0,0196	0,44094	-0,11811	0,81	-0,0568	0,43854	-0,12682
2	Serbia	29410	69	-30	0,54715	-0,11659	0,41176	-0,03922	0,3937	-0,16535	0,7796	-0,0872	0,46814	-0,09722
3	Croatia	244	47	-8	0,62817	-0,03557	0,33333	-0,11765	0,46456	-0,09449	0,7928	-0,0740	0,62711	0,06175
4	Austria	NA	20	19	0,79124	0,1275	0,62745	0,17647	0,74803	0,18898	0,8660	-0,0008	0,75972	0,19436
5	Slovakia	NA	51	-12	0,61478	-0,04896	0,62745	0,17647	0,48818	-0,07087	0,8265	-0,0403	0,52963	-0,03573
6	Slovenia	NA	41	-2	0,65054	-0,0132	0,39215	-0,05883	0,42519	-0,13386	0,9072	0,0404	0,61925	0,05389
7	Ukraine	NA	87	-48	0,50316	-0,16058	0,43137	-0,01961	0,26771	-0,29134	0,8616	-0,0052	0,38016	-0,1852
8	Germany	2361	21	18	0,78640	0,12266	0,70588	0,2549	0,66929	0,11024	0,8862	0,0194	0,80377	0,23841
9	USA	1152	7	32	0,87483	0,21109	0,92156	0,47058	0,94488	0,38583	0,939	0,0722	0,74059	0,17523
10	Canada	832	11	28	0,84177	0,17803	0,82352	0,37254	0,91338	0,35433	0,8952	0,0284	0,71676	0,1514
11	Switzerland	655	30	9	0,72670	0,06296	0,37254	-0,07844	0,50393	-0,05512	0,8562	-0,0106	0,81992	0,25456
12	UK	647	8	31	0,86948	0,20574	0,96078	0,50980	0,89763	0,33858	0,8574	-0,0094	0,85340	0,28804
13	Australia	573	2	37	0,91034	0,24660	0,94117	0,49019	0,92913	0,37008	0,9978	0,1310	0,80405	0,23869
14	Sweden	414	14	25	0,82250	0,15876	0,60784	0,15686	0,70078	0,14173	0,8802	0,0134	0,88656	0,3212
15	France	291	4	35	0,89384	0,23010	0,96078	0,5098	1,00000	0,44095	0,8812	0,0144	0,80029	0,23493
16	Italy	250	23	16	0,75930	0,09556	0,78431	0,33333	0,74803	0,18898	0,8552	-0,0116	0,67473	0,10937
17	Netherlands	157	5	34	0,88966	0,22592	1,00000	0,54902	0,92913	0,37008	0,9224	0,0556	0,81751	0,25215
18	Israel	141	17	22	0,81615	0,15241	0,86274	0,41176	0,87401	0,31496	0,8545	-0,0123	0,71998	0,15462
19	Belgium	133	25	14	0,75638	0,09264	0,62745	0,17647	0,67716	0,11811	0,8932	0,0264	0,69880	0,13344
20	Spain	133	12	27	0,84098	0,17724	0,78431	0,33333	0,94488	0,38583	0,9152	0,0484	0,66288	0,09752

Taking the case of Romania, which has the highest registered number of Hungarian external voters, e-Government development is slightly less than Hungary but its e-Participation Index is better, showing higher willingness of people living in Romania to be present in on-line services. By looking at the Technology Infrastructure Index differences we may conclude, that these are minor in the CEE region, and will quickly closing in, basically eliminating technology differences due to the development provided by the EU cohesion and structural funds and the actitivites of the ICT industries.

To get more insights into how government transparency is assessed by citizens, we compiled further data in Table 4. Table from the e-Government Benchmark Survey to compare the same countries from the points of service, public organizations and personal data scoring (European Commission, 2013). The report which examined the usage of 19 public administration services, states that the Hungarian data of use are almost 41 percent lower than the European average, Hungary took the 30th of the 32 places in the European ranking. The rate of those trusting and regularly using e-Government services is 6 percent lower than the average of the EU members (32 percent), while the proportion of those preferring offline administrations is 11 percent higher than the Union average (38 percent).

What we can see from Table 4. Tableis that in most countries where external voters reside trust in government transparency is lower than the EU average, so development will be essential to enhance trust in e-Voting. For instance in Romania, which is the most significant from this point of view we have a score of 6 on service transparency and 0 on personal data, which offer major rooms to improve compared to the EU-averages of 41 and 43 respectively. On the other hand, countries such as Austria, Belgium and Spain might serve as potential e-Voting experiments due their high citizen trust in government transparency.

4. Table. Government transparency from user perspective in countries significant from out-of-country voting perspectives (European Commission, 2013)

	Country Name	Registered external voters	Service delivery	Public organizations	Personal data
	Hungary		28	32	17
1	Romania	103654	6	48	0
2	Serbia	29410	NA	NA	NA
3	Croatia	244	33	56	56
4	Austria	NA	53	80	75
5	Slovakia	NA	4	44	0
6	Slovenia	NA	60	90	78
7	Ukraine	NA	NA	NA	NA
8	Germany	2361	31	57	33
9	USA	1152	NA	NA	NA
10	Canada	832	NA	NA	NA
11	Switzerland	655	12	74	6
12	UK	647	32	48	31

	Country Name	Registered external voters	Service delivery	Public organizations	Personal data
13	Australia	573	NA	NA	NA
14	Sweden	414	53	70	86
15	France	291	40	50	75
16	Italy	250	18	56	33
17	Netherlands	157	56	76	67
18	Israel	141	NA	NA	NA
19	Belgium	133	58	72	25
20	Spain	133	86	82	78
	EU 27 average		41	66	43

Creating trust in institutions: social construction of e-Voting

As Julie Freeman and Sharna Quirke has phrased, digital democracy, e-participation, and greater civic engagement have subsequently been labelled myths of e-government; unlikely to occur without broader changes in the culture of government to be more open, receptive and responsive to civic views (Freeman & Quirke, 2013, p.: 31). They argue that most governments – like also the governments of Hungary - have placed little emphasis on the development of online practices that enable civic contributions to impact decision-making, instead prioritised information dissemination and service delivery features, that is they placed the integrative and efficiency orientation of e-Government in the centre of development strategies.

This is understandable from the point that e-Voting socio-technical solutions require high level of e-democracy maturity, or at least this assumption has been rather dominant in European research efforts such as the STOA Workshops (STOA, 2011). Also Murder and Hartog suggests that e-democracy has a certain value chain with elements systematically built upon each other (Mulder & Hartog, 2013). They are rather pessimistic about the short term results in this area, because the individual e-democracy projects carry inherent political risks, the technological possibilities are complex and relatively new, tested solutions may be unavailable and politicians may prefer short-term projects. There is little thinking on the broad and structural adoption of e-democratic solutions. They argue that the e-democracy value chain has to be building up as the following sequence (Mulder & Hartog, 2013, p.: 27):

- Being informed is an essential requirement that allows citizens to know what is going on and communicate their opinion.
- Deliberating provides the ability to engage in structured dialogue and reflection leading to insight and conclusions.
- Valuing the results of the dialogue would allow for identifying and prioritization the issues that need attention.
- Decision making is a distinct process allowing the development of structured argumentation and solution formulation.
- Voting allows participants to finally converge on a single political outcome.

Consequently, as a fourth driver of our research agenda we propose the exploration of the social mechanisms of how trust is built up in the "e-democracy value-chain", and to find the connections of different institutional and emergent elements of how structuration of trust occurs and is enhanced by technology.

In the field of information systems structurational models – stemming from Giddens´s general structuration theory - are very useful theoretical frames to conceptualize the social process through which technologies are implemented, used and institutionalized (Jones & Karsten, 2008). In the centre of structurational concepts we find structure: which is defined as a set of rules and resources organized as properties of social systems. Systems are reproduced relations between actors or collectives, organized as regular social practices, and according to these constructs social structure is constantly created through the flow of everyday practices shaped by a mutually constitutive duality of agency and institutions (Jones, Orlikowski, & Munir, 2004). Earlier, at the desire-to-vote section we showed that behaviour of younger generation are key, how democratic institutions of elections perform, and that the final political aim of ICT enhanced elections – social structuration in this context - is to create a sustainable interplay between institutions and voters behaviour.

In the case of Hungarian young voters compared to the European average they are much less consider effective contribution to political democracy through voting (Eurobarometer, 2013) . Promising directions as we see in Figure 3. Figureare the relatively higher social sensitivity and willingness to join NGOs and associations in the public sphere.
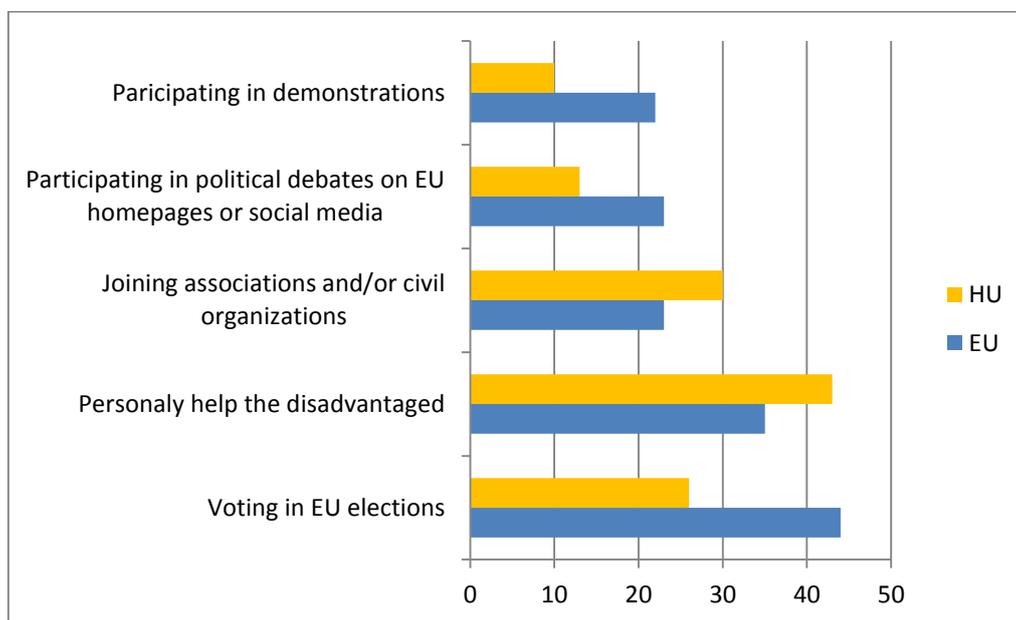
3. Figure. Which is the best way for you to effectively participate in EU public debates? (% of respondents) (Eurobarometer, 2013)

In alignment the Eurobarometer finding, recent Hungarian empirical studies have alarming results about the declining trust in public participation and trust in institutions (Székely,

2013). Practically, the findings of the research show that there is not one single institution in Hungary which would enjoy the trust of the 15-29 generation, only the military, police and court system was scored on the positive range of the trust scale. 19% of this generation reported that they would participate in voting with certainty. The Hungarian Youth – 2012 research project also found that interest of all educated social groups has declined in politics – 57% of respondents indicated that they are not paying attention under any circumstances to politics (Székely, 2013). Earlier in the same research in 2008 34% reported that they would vote with certainty, and 9% less replied with definite not participation (16%) in 2008.

Since 2008 a drastic decline can be observed in the perceived trust in the Constitutional Court and President of the Republic, but also growing negative perception about economical institutions such as banks for instance. Young Hungarians have such a low level of trust in democratic institutions, that only 40% of them considers democracy as the best possible political system, and – although most of them never lived at the time – nurture nostalgic ideas about the "goulash communism" of Hungary (Székely, 2013).

When we briefly interviewed the Director of the Hungarian National Election Committee about the possibilities of e-Voting, she had three fundamental statements about the situation reflecting the attitude of the electoral organization, the key institution regarding elections:

   a) e-Voting is first of all a political question, not a technical dilemma.
   b) Within the political theme it is an issue of trust; trust in institutions, democracy and only after that - technology.
   c) From an operative point of view she prioritised the problem as a legal regulatory problem, not as a technology development issue.

She had not envisioned anything better in the near future than postal voting for the out-of-country voting, arguing that integrity, transparency and reliability is a much greater political value in the election process than the slight potential of increasing desire-to-vote by risky ICT innovations. Indeed, amongst the social mechanisms which create trust in e-voting system, the trusted electoral agency has to be prepared to transform conduct of its mission through ICT (Avgerou, 2013)

Creating and restoring trust in democratic institution and the enhancement of social construction of the e-democracy value-chain seems to be the most critical factor of e-Voting experiments in Hungary and CEE, which leads us to the fifth research proposition – the systematic R+D in e-Voting.

Creating an R+D environment: experimenting with e-Voting

As the level of ICT uptake in government processes increases, the number of experiments, pilot research projects, controlled tests and technology showcases might be more and more relevant for increasing user awareness. Under this last research scheme proposal, we build argument to consider e-Voting R+D initiatives which could provide real empirical experiences of e-Voting in the CEE region.

In an earlier research project in 2014 we investigated the R+D programs of ICT based modernization of Hungarian public administration (Aranyossy, Fekó, & Nemeslaki, 2014). We found that in the period of 2007-2014 there were two types of EU structural fund development schemes, other sources in this period were so little that they had not much impact beside these EU grants. Service and technology modernization was provided by the Electronic Public Administration Operational Programme (EPAOP) while organizational and human resources modernization is ensured by the State Reform Operational Programme (SROP).

EPAOP was aimed to increase performance in public administration by means of ICT developments: to reduce administration in the public sector, to improve the level of services and to assure effective operation of public administration. The mission of the State Reform Operational Programme (SROP) was to enhance the performance of the public administration system through institutional capacity building: to improve the human resources and to modernise the organisational operation. Accordingly, the priority axes of the operational programme are focused on the two main resources of the public administration system, i.e. on the development of human resources and on organizational processes. Table 5. Table and Table 6. Table summarize the key financial data and priorities of these programmes.

5. Table. Electronic Public Administration Operational Programme (EPAOP) (Aranyossy, Fekó, & Nemeslaki, 2014)

Priority title	Fund	Budget (M EUR)	Budget (HUF billion)
Priority 1: Public administration and renewal of the internal processes of administrative services	ERDF	174,086	51,686
Priority 2: Projects promoting access to public administration services	ERDF	133,186	39,543
Priority 3: Priority projects	ERDF	83,264	24,721
Priority 4: Technical assistance in convergence regions	ERDF	5,632	1,672
Priority 5: Technical assistance in the Central Hungary region	ERDF	1,526	0,453

6. Table. State Reform Operational Programme (SROP) (Aranyossy, Fekó, & Nemeslaki, 2014)

Priority title	Fund	Budget (M EUR)	Budget (HUF billion)
Priority 1: Renewal of processes and organization development	ESF	79,919	23,728
Priority 2: Improving the quality of human resources	ESF	31,819	9,447
Priority 3: Developments in the Central Hungary Region	ESF	47,420	14,079
Priority 4: Technical assistance in the convergence regions	ESF	4,651	1,381
Priority 5: Technical assistance in the Central Hungary Region	ESF	1,974	0,586

We analyzed the objectives, beneficiaries, budgets and durations of the projects in different government periods, since we assumed that the governmental visions might influence the main objectives and other characteristics. In the analysis we used text mining to juxtapose the official objective statements of the particular projects with their keywords appearing in the feasibility studies to assess how much they adhere to the original strategic initiations. Figure 4. Figure illustrates the significant differences based on the keyword frequency in the different governmental periods.

In the period 2007-2008 „Gyurcsány Government" and 2009-2010 "Bajnai Government" the development and IT support of the judicial systems was important while the related keywords disappeared from the project objectives during the "Orbán Government". Consequently, the main beneficiaries in these periods were the Ministry of Public Administration and Justice and the Ministry of Justice and Law Enforcement later.

While "strategic" approach was frequent in the „Gyurcsány Government", some of the prevalent keywords in the "Orbán Government" – previously absent – were "integrate", "opportunity", "formation" and "realization", suggesting a different approach to development.

In the first and third governmental cycle the average contract sum of projects was quite high (EUR 5,25 and 4,21 million), the planned project duration was longer than 2 years, while the "Bajnai Government" financed significantly smaller projects (EUR 2,67million). On the other hand, the „Gyurcsány Government" started long projects (30 month in average), while in the next two governmental periods the projects were significantly shorter (22 and 20 month).

4. Figure Governments influence on EPAOP and SROP projects (only the significant differences displayed, α<10%)
(Aranyossy, Fekó, & Nemeslaki, 2014)

Based on our text analysis of EPAOP and SROP projects we found that the fields which were not emphasized among project goals were:

- the role of participation and social partners,
- local-governance;
- to improve user skills through public information campaigns.

This in-depth analysis shows that in the next planning cycle of the 2014-2020 e-Government developments there is much room for R+D initiatives in e-democracy, e-participation and e-Voting pilot developments building on the EPAOP and SROP results.

Conclusions

In this research agenda paper we propose five directions for e-Voting development in the Hungarian and broader CEE context based on a conceptual review of the topic and some empirical data and observations.

Firstly, we identified the relevance and opportunity in the CEE region of the "virtual nationality" concept both in the EU context and in trans-national settings. Increasing national cohesion for out-of-country citizens might serve as a driver and essential political motivator for e-Voting experiments even in less "participatory" countries.

Secondly, building e-Voting programmes on comprehensive cybersecurity foundations also might indicate more likely institutional trust building especially in the technical mechanisms of the electronic voting processes. Comprehensiveness in this context covers coordinated technical, legal and educational approach to information security with a potentially wide spill over impact in security awareness which opens up doors for e-Voting development

Thirdly, we argued that creating and enhancing e-Government solutions gradually increase participation which in return increases willingness to technology adoption. Given the fact, that e-Voting is on the top of e-participation maturity chain, building up the level of ICT adoption and use, both on the institutional and citizen side, contributes to a more astute and innovative social environment. We argued that out-of-country voting might be a special driver in this context when a country extends e-Voting to a more e-participative country than its home base.

Fourthly, with the illustration of sociological research amongst youth in Europe and Hungary we proposed an intensive stream of constructivist inquiry how trust can be built in democratic institutions via technology and how electoral organizations can be won to embrace the idea of e-Voting initiations. In our context of Hungary, and in CEE, this is a critical element of any future development in e-Voting since there are deeply rooted social barriers which hinder technology deployments for enhancing democratic participation.

Finally, the fifth research stream in our proposition agenda is the R+D necessity of e-Voting in controlled and gradually extended environments. After the in depth analysis of the public ICT R+D projects in the 2007-2013 programming period we found that those were focusing

on the integrative development of e-Government; e-Governance has been neglected both in the technology aspect and in the awareness dimensions. By looking at the project results, however, the more developed e-Government infrastructure might serve as a spring-board for e-governance and participation programmes for the 2014-2020 planning cycle.

In conclusion, we offer our arguments not only to the Hungarian and CEE context, so that the fictitious e-Voting future could be brought closer to reality, but by developing this multifaceted research scheme we may also find useful theoretical contribution to the field of e-democracy in general.

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