

## Bidirectional voting and continuous voting concepts as possible use of Internet in democratic voting process

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**Abstract**—Democracies need elections for choosing their authorities and governments. This process has many factors that shape today's procedures. However, the Internet is a medium that may change the possibilities and elections. The main issue is concern on how changes may influence the whole democratic process. This paper shows two possible ideas – that of bidirectional voting and continuous voting, and considers possible reasons for introducing changes as well as the consequences. An introductory research in into this matter gives additional hints.

### I. INTRODUCTION

THE INTERNET changes almost everything. It introduced powerful digital goods markets, it empowered the role of information as a strategic good. In this paper the author shows the considerations on how it may affect an election process in order to make it more efficient. For discovering that, it is necessary to bring some thoughts on the politicians' motivations on elections - which seems to be somehow parallel to the process of raising children by its parents. Of course this should be said in context of the aims of the whole election process. Therefore this paper consists of a discussion on the voting process (including Internet voting), brought in chapter 2, followed by an analysis of the politicians' motivations. Then two solutions are proposed that may increase an election effectiveness – namely the bidirectional voting and continuous voting concepts. Those theoretical considerations should be followed by a research on voters' opinions, which is presented in chapter 6. Last chapter presents the author's conclusions.

### II. VOTING PROCESS AND INTERNET VOTING

To propose any changes in electoral systems we need to think about their meaning, function and purpose. In Book II, Chapter 2 of his book 'The Spirit of Laws', Montesquieu states that in the case of elections in either a republic or a democracy, voters alternate between being the rulers of the country and being the subjects of the government. By the act of voting, the people operate in a sovereign (or ruling) capacity, acting as "masters" to select their government's "come." [6]

In more practical way we may read in Encyclopedia Britannica that regular elections serve to hold leaders accountable for their performance and permit an exchange of influ-

ence between the governors and the governed. The availability of alternatives is a necessary condition. [7]

We need to remember, that due to fact that people may vote against ruling government, for having effective elections their organization must safeguard the privacy of voting – understood as the impossibility to trace who voted how and as much as possible, the impossibility to influence on given votes. It is important, while providing election officials with an audit trail that can be used to conduct recounts of election results. [2] Moreover, we need to remember that the whole process needs to gain public acceptance and trust. So, one basic precondition for e-elections must be the feasibility of implementing the voting under such conditions that the principles underpinning the electoral system are not disregarded. Accordingly, the system must be at least as secure as corresponding traditional voting procedures. Another precondition is that the e-voting procedure must be simple and function smoothly for the voters. Its overall purpose is to enhance accessibility to voters. [10]

Therefore an electronic voting system via the Internet must fulfill the following basic requirements according to its trustworthiness and legitimacy [10]:

- Only people eligible to vote should be able to vote (identification).
- It should be possible to use one's vote only once .
- Ballots should be absolutely secret.
- It should not be possible for a vote cast to be changed by anyone else.
- The system should ensure correct tallying of votes at all levels (voting district, constituency and area).

We can count some opportunities to electronic voting [8]:

- Most countries believe that Internet voting will occur within the next decade.
- Internet voting options satisfy voter's desire for convenience.
- Internet voting can meet the voting needs of the physically disabled.
- Several countries are ready to try Internet voting for a small application immediately.

- Several countries are contemplating voting system replacement and are frustrated with the limited number of options available.

But such system would face many barriers as well – like the difficulty of guaranteeing ballot secrecy with an absolutely certain guarantee. Another is a the question of the reliability of the system, i.e. that the system will in all situations function in the manner in which it is meant to function. Another disadvantage is the expense of development and operation. All in all, then, the primary considerations are security and reliability. [10]

Some others may be [8]:

- Lack of common voting system standards across nations.
- Time and difficulty of changing national election laws.
- Time and cost of certifying a voting system.
- Security and reliability of electronic voting.
- Equal access to Internet voting for all socioeconomic groups.
- Difficulty of training election judges on a new system.
- Political risk associated with trying a new voting system.
- Need for security and election experts.

### III. ARE POLITICIANS LIKE KIDS?

Now we can think about the motivations that drive politicians taking part in elections. We may understand their goals idealistically, i.e. that they are trying to serve country and/or community. But serving people requires getting into power – in words; winning elections. Unfortunately, common observations make most of people to doubt such motivation, making many people believe that their most important aim is to get into power using the program as a tool rather than the goal itself. Of course, it shouldn't be generalized – especially that winning elections almost always requires many alliances with factions fractions that may sometimes have very distant views on selected topics.

However, one may try to find similarities between the election process and raising kids, when they grow. They both are observing responses from the surrounding world (politicians through pools and children through observation of their parents' and other persons' reactions). So by giving them a feedback information, giving hints to what is good and what is bad. They both (politicians and kids) try to behave in a way that maximizes their goals. In the case of politicians of course the aim is to get as many votes as possible.

Children interact with parents constantly – and parents may react in different ways. So let us now consider models of the process of raising kids. Usually we may distinguish two contradictory models and some located in between. We shall discuss only the extreme ones. The First one is a very strict model of raising kids (where children have a lot of restrictions and are punished when they do wrong, but ideally

a lot of sensitivity and appreciation when they do good as well). Second one is so called 'stress-less' raising (where children are positively motivated and allowed many things that would be banned by strict parents – which means that they are rarely or never punished, ideally with as much positive motivation as possible and as little punishment as possible). It is Commonly is known, that in first case children will probably care more about others' people needs, but normally will be more backward behaving, they normally shall think about consequences before they do something. In the stress-less case children will be probably more open, active and sometimes even pushing the limits in search what they can. Having less fear they will experiment more willingly even without deeper considerations.

More deep considerations may be found in articles by Diana Baumrind [3], [4] who found what she considered to be the four basic elements that could help shape successful parenting.

TABLE 1:  
PARENTING STYLES [5]

		Strictness/supervision	
		High	Low
Acceptance/ Involve- ment	High	Authoritative	Indulgent
	Low	Authoritarian	Neglectful

Such descriptions would be reasonable as well for politicians' deeds. But we need to find two basic distinctions between kids and politicians.

First one is that raising kids is a continuous process – and elections happen (normally nowadays) once every 3-5 years (depending on country and subject of election). During the period in between elections politicians are not effectively rated - in terms of bouncing out-of the position.

The second difference is that in raising kids we may see two models (discussed earlier – strict with negative and positive incentives and stressless – with mostly positive incentives), whilst on elections basically we have only positive votes (which is positive incentive) and after elections politicians are normally safe (until next elections), which may be perceived just as lack of any incentives.

This may lead to conclusion, that lack of negative incentives pushes politicians to strategies of freely pushing limits in search what they can (regardless of true intentions) for getting into power (almost), which is reminiscent of the stressless way of raising kids. Of course in the case of politicians, we'd willingly see responsible, forward-looking persons serving country and regional needs. However achieving this may require (just like in a the process of raising children) adding some negative incentives as well as continuous feedback.

### IV. BIDIRECTIONAL VOTING

Negative voting (as of intentions) is said to occur when circumstances are unfavorable to the interests or preferences of constituents and evoke a stronger electoral response than comparable favorable circumstances evoke. [11]

The idea of bidirectional voting means giving voters possibility of having two votes – one positive (as usual) and one negative (new). Each voter would have ability to decide which votes to give to whom (and if any – voter would have a chance to give only one – either positive or negative vote). That idea is sometimes called ‘negative voting’ (in terms of votes), which seems to be miss-named to the author – while negative voting should be exactly opposite to the traditional way, which may be called ‘positive voting’, as voters have only positive votes. Thus negative voting should mean eliminating candidates (instead of choosing as it is now), which may lead to choosing people and parties without any ideas.

The idea of giving both positive and negative votes would bring a new possibility of expressing disagreement with politicians. One of possible ways of dealing with such votes, could be that negative votes would have to be subtracted from positive ones. This might enforce more responsibility on politicians, as their false or freaky ideas would decrease their election chances, especially in case if it would be required a quite straightforward requirement to gain more positive votes than negative ones (either or both in case of whole parties and in case of each candidate).

It has to be pointed that such a system would bring the possible risk of almost randomly chosen parties – for instance in the theoretical situations when

- a party ‘A’ would gain  
49% of positive votes and 48% negative votes,
- a party ‘B’ would gain  
47% of positive votes and 48% negative votes,
- a party ‘C’ would gain  
3% of positive votes and 1% of negative votes,
- a party ‘D’ would gain  
1% of positive votes and 3% of negative votes,

a party ‘D’ would gain 1% of positive votes and 3% of negative votes - the winners would be parties ‘C’ and ‘A’ with 2% and 1% of votes net, which recalculates to 67% and 33% and gives a majority to extremely small party, which gained only little votes. However, this problem might be reduced by keeping the normally existing thresholds of for instance 5% of all positive-only votes (which in example above would eliminate tiny parties ‘C’ and ‘D’).

Furthermore it is worth mentioning, that in case of possible (not mandatory) giving positive and/or negative votes, a much more probable situation then mentioned above would be gaining by all parties more negative votes than positive ones. This would drive into the situation, when no-one could be elected, which would enforce the need for another election. However, this would give a possibility to show, that current politicians have lost connection with real-life (which is quite often regarded not to be very rare in politics). Such situation would require then organization of next elections in a short period of time, but would show, that radical changes in the politicians’ programs are deeply expected and required.

## V. CONTINUOUS VOTING

It is possible to figure out probable reasons why elections are hold every 3-5 years. Quite straightforward one of them seems to be of economical nature – elections preparation and conducting does cost quite a lot. So it wouldn’t be sensible to organize it too often. Similarly, chosen politicians do have to have a reasonable time for bringing their programs into life (which normally is a huge task concerning a scale of a whole state). Moreover, politicians on the election year tend to promise and do almost only things that might be perceives as popular. On the other hand, organizing elections too rarely would limit possibilities of changing politicians in case of poor or ineffective leading state (or local) affairs.

Things seem to be different in case of an Internet voting. In this case it is possible to organize it far cheaper, which may give a chance for organizing votings much more often. But we need to think about possible reasons for more often votings – just as at the beginning of this chapter were given reasons for not doing it too often. That implies, that it shouldn’t play role of simply more frequent elections as we know them nowadays. But, in chapter 4 (are politicians like kids?) we reached a conclusion, that a form of an feedback seems to be very important in controlling politicians. And this is the field, where continuous voting may seem to be very valuable. Furthermore, in the same chapter 4 we pointed, that a form of negative motivation usually helps in balancing behaviours, which may be very valuable for making politicians’ work more for the society than nowadays it seems to be on average. For instance, voting for the worst politician (in terms of chosen in elections – like deputy, parliament member etc.) for having such deputy somehow punished may have a chance to be very positive in terms of quality of their work for the society. Such punishment should be serious one – probably most perceptible and most fair punishment for a deputy that had been chosen the worst one would be taking back such person’s seat (mandate). Such continuous, serious threat would force taking into consideration voter’s perception of their actions. This might constantly remind the reason why they were chosen.

To achieve same effect at parties level – such seat might stay empty until next elections, which would weaken party of the worst deputy.

On the other hand very important seems to be the positive motivation. So just like choosing the worst deputy as well the best one might be chosen. What might be a serious reward for the best deputy? Probably mandate (seat) in next elections (meaning without taking part in elections). Would it be unfair? Rather no, as this comes from people’s voting, just like during elections.

Next we should consider how often such votings should be organized. Probably quite often, as it is known from the pedagogy and psychology, that the punishment (or reward) needs to be immediate. On the other hand, a threat of facing only very little votes given (which would make it meaningless) and on the other hand facing too many deputies left in negative voting (or safeguarded in positive voting) their seats shows that such votings shouldn’t be organized too often as well. In author’s opinion the right scale for this

process would be potential elimination of 3 to 5% (maximum of about 10%) of deputies as well as rewarding the same quota. In such case, a feasible frequency for Poland would seem to be for instance once every 3 months, which would cause potential threat (and opportunity) for maximum 15 deputies during 4 years period. It is worth mentioning that bidirectional voting in such case would additionally give chance to people to say ‘no one deserves punishment (reward)’ by not giving negative (positive) votes, which is good, because in fact it shouldn’t be obligatory to punish (or reward) someone every time.

Thinking about a punishment (reward) we need to point another problem – in case that there is only minimal number of people taking part in such voting – let’s say only 10 persons gave their votes. Of course in such case it would not be fair to regard such a voting to be binding one. But this problem is easy to eliminate – it may be added a requirement that for instance at least 5% of voters has to vote for regarding such voting to be a valid one. Additionally for safeguarding controversial, but fair and effective deputies, who may receive a lot of both positive and negative votes – it may be required that for punishing (rewarding) of such controversial deputy would be necessary to reach difference of not less than 3% of all given votes between positive and negative votes.

## VI. RESEARCH

The research was conducted on 68 students of Gdańsk University of Technology, in April 2010. It was devoted to search main reasons of voting and possible ways of making it more effective.

To understand the outcomes, we should realize that participation in elections in Poland is not compulsory, which results in frequencies below 50%. Moreover, voters are presented ballots with names of parties and candidates of these parties blocked together. Voters are choosing only one person, giving their vote to this person and its party at the same time. To enter the parliament or a local authority, a party needs to gain at least 5% of valid votes. Then, a number of mandates for each party is calculated and seats are allocated to candidates that won relatively most votes.

The first question of research was „which statement presents best your motivation for giving a vote to the candidate you voted for during last elections (and for going to elections at all)”. The most important motivations were “I didn’t support any of parties, so I voted choosing least evil option” (19,1%), “I didn’t took part in elections because I saw no sense in voting (or as a private protest)” (17,6%), “I support both the party and the person I voted for” (17,6%), “I know and support the party and I chose a more or less random person from the party” (16,2%), “I didn’t go for elections because there was no one worth voting for” (11,8%).

It seems to be worrisome, that three out of five most important motivations, chosen by a total of 48,5% of respondents, were negative (1st, 2nd and 5th), whilst voting is meant to be primarily positive choice process.

In next question respondents were asked “how long before elections have you decided on whom to vote”. The most frequent answers were “a couple of days” (32,4%), “just before elections” (22,1%), “a couple of months” (17,6%), a couple of weeks” (13,2%).

These answers do not really seem to be constructive as well, as they show that voters don’t have stable views – as a couple of days before elections about 54,1% of them didn’t know whom to vote for. Situation is even worse a couple of weeks before elections, ranging about 67,3% of undecided voters.

Another question asked was an attitude for the bidirectional voting concept. It was formulated as a general question “If it would be possible to give a vote ‘against’ apart from vote ‘for’, would you:” followed by five statements:

- “use such possibility”:
  - ‘definitely yes’ 54,4%, rather yes ’32,4%’,
  - ‘rather no’ 10,3%, ‘definitely no’ 1,5%
- “give both votes”:
  - ‘definitely yes’ 38,2%, rather yes ’45,6%’,
  - ‘rather no’ 11,8%, ‘definitely no’ 2,9%
- “feel that it would be easier to make a decision”:
  - ‘definitely yes’ 27,9%, rather yes ’36,8%’,
  - ‘rather no’ 29,4%, ‘definitely no’ 4,4%
- “feel that you can more completely show your views”:
  - ‘definitely yes’ 50,0%, rather yes ’41,2%’,
  - ‘rather no’ 4,4%, ‘definitely no’ 2,9%
- “consider it to be fair”:
  - ‘definitely yes’ 41,2%, rather yes ’45,6%’,
  - ‘rather no’ 7,4%, ‘definitely no’ 4,4%

This shows, that young, educated voters would welcome a new option of bidirectional voting - voting ‘against’ as a complimentary to voting ‘for’. What is additionally important, among respondents who in the first question („which statement presents best your motivation for giving a vote to a candidate you voted for during last elections”) pointed most frequent answer “I didn’t support any of parties, so I voted choosing least evil option” 100% chosen that they would like to use possibility of giving negative vote. Moreover, of these who pointed answer “I didn’t do for elections because I saw no sense in voting” 75% chosen that they would like to use possibility of giving negative vote. And among those, who pointed answer “I didn’t go for elections because there was no one worth voting for” 62,5% chosen that they would like to use possibility of giving negative vote. This shows, that introducing bidirectional voting may help people to show their preferences in a better way, which should drive to potentially higher level of participation in elections.

Last question was asking about attitude towards voting through Internet in terms:

- “I think that voting through Internet should be available”
  - ‘definitely yes’ 61,8%, rather yes ’23,5%’,
  - ‘rather no’ 10,3%, ‘definitely no’ 4,4%
- “I would willingly give vote through Internet”
  - ‘definitely yes’ 58,8%, ‘rather yes’ 23,5%,
  - ‘rather no’ 14,7%, ‘definitely no’ 1,5%

This shows that young, educated people would welcome possibility of voting through Internet, which technologically would allow bidirectional voting, as it was described earlier.

## VII. CONCLUSIONS

As we may see, Internet use in elections may help introduce new ideas on how to vote for having politicians to be more motivated for better taking care of common issues. The idea of bidirectional voting may help people to show their preferences in a better way, which may drive to a potentially higher level of participation in elections. On the other hand introduction of the continuous voting (which due to costs wouldn't be possible without Internet use) may introduce better control over politicians' deeds by continuous grading, which because of immediate reaction normally is most effective way of controlling of all recent deputy initiatives. This reflects that bringing these ideas into life may help election process to achieve a new, better quality and give a chance to improve democratic processes.

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