Internet Voting: A Smarter Way to Vote in Pakistan

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ABSTRACT
Over the years, the average voter turnout in Pakistan General Elections has been around 45%, ranking Pakistan among countries with the lowest turnout in the world. Some of the reasons contributing to this low turnout were found to be lack of trust in the electoral system and hesitancy to travel to the polling stations. The aim of this research is to suggest ways to increase the voter turnout in Pakistan. Our work is targeted towards the educated voters but it can be applied to the rest of the population as well. The survey conducted indicated that use of Internet Voting could reduce these issues.

Categories and Subject Descriptors
J.1[**Administrative Data Processing**]: Government

General Terms
Human Factors

Keywords
Electronic Voting; Internet Voting; Voter Turnout

1. INTRODUCTION
Voter turnout is the percentage of eligible voters who cast votes in an election. Pakistan has held nine general elections since 1971. The average voter turnout has been around 45.92% [1]. This makes Pakistan amongst the countries having low voter turnout [3]. In the 2008 elections there were over 570,000 people involved in the polling process [2]. By reducing the human intervention in elections, the tendency of the system to succumb to irregularities can be curtailed. This helps in efficient counting and reducing the overall time to declare the results.

The low turnout can be related to the large amount of effort required to reach a polling station. According to a survey of registered non voters in the 2008 US Elections [4], 15% had some disability or illness, 17% were too busy or had conflicting schedules, 3% did not have a convenient polling place and another 3% did not have adequate transportation.

In the 2008 elections in Pakistan, 87% of the voting-age population got registered as voters whereas in 2013 this number was 74% [1]. However out of the total registered voters the voter turnout in 2008 was 44.55% which increased to 55.02% in 2013 elections. This data [1] also shows that out of the total voting-age population only 38.77% voted in the 2008 general elections whereas this number was 40.49% in 2013 general elections. Assuming that there was a uniform distribution of educated voters among the turnout, the average number of educated voters could be assumed to be around 38% to 40% in the last two general elections in Pakistan. For a budding democracy like Pakistan, it is vital to increase the participation of the educated class in elections. A higher level of education generally implies more comfort with using the Internet. Therefore, Internet Voting can be effective in increasing the turnout of educated voters.

Other benefits of Internet Voting may include: Reduction in the number of management staff; Reduction in the time and effort required for voting; and Large-scale reduction in the usage of paper and printing cost. These benefits of Internet Voting may result in a leaner, more efficient, and environment friendly voting system and hence a smarter government.

Internet Voting has its associated challenges too. Some of them are global in nature like: Trust on Internet Voting [5]; The inherent security vulnerabilities of the Internet [8], [6]; Buying of votes [7]; Coercion of voters [7].

Implementation of Internet Voting in Pakistan poses a unique set of challenges which include: 1) availability and reliability of broadband Internet; 2) severe electric power crisis.

2. INTERNET VOTING AND TURNOUT: A SURVEY
A survey was conducted to study the relation (if any present) of Internet Voting with the turnout of educated voters and to find the answer to the question: Can Internet Voting increase the turnout of educated voters? The target population was the educated voters that include individuals with varying backgrounds, levels of education, age, professions and gender. Faculty, staff and students of different universities of Pakistan were selected through systematic random sampling. Effort was made to reach the respondents through mailing lists and social media. In total 167 responses were received. The questionnaire consisted of 43 questions and the survey was conducted through Google Forms.

3. DESCRIPTIVE RESULTS
Out of the total respondents 78% were male whereas 22% were female. More than 90% of the participants had 16 years or more of education. Out of 167 participants, 23% chose not to divulge their incomes. Out of the rest, around 59% of the participants earned up to 100,000 rupees. Over 82% of the participants indicated that they spent more than four hours per day using computers.

Out of the 167 participants, 64% of the participants belonged to the province of Punjab. 49% did not reside in the constituencies where their vote was registered and 25% were Overseas

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Pakistanis. 16% of the participants responded that they will not vote due to issues in traveling to their constituency. Out of the 117 participants who did not vote in the 2008 elections, 44.5% responded that they would consider voting had Internet Voting options were available. They also indicated issues in travelling to their constituency as one of the major reasons for not voting.

The participants were asked to rank the voting methods: Poll (Ballot, Electronic Voting Machine), and Internet (Phone, Computers, Kiosks) from least preferred to most preferred. By comparing the individual Poll and Internet Voting preference scores it was found that 75% of the participants assigned a higher preference score to Internet Voting methods.

4. ANALYSIS AND DISCUSSION

Pearson coefficient was used to find correlations between characteristics of Internet Voting with voting method preference scores. Voting methods were calculated by using the formulas given in Equation 1.

$$PPS_i = Mean(Ballot_i; EVM_i) / 6 \quad (1)$$
$$IPS_i = Mean(Phone_i; Computers_i; Kiosk_i) / 6$$

where PPS_i stands for Poll Preference Score and IPS_i stands for Internet Preference Score for each individual participant ***i***. The results are given in Tables 1 and 2. Spearman's coefficient was used to find correlations between the personal and technological profile of a participant and the preference scores. Furthermore, as shown in Table 2 the Internet Voting methods have a significant positive correlation with the characteristics: Reduction in effort, Reduction in counting errors, Reduction in unethical practices, and Improvement in security. On the other hand the Poll Voting methods have a significant negative correlation with them.

Table 1: Correlation between Voting Methods

Method	Ballot	EVM	ATM	Phones	Computers	SMS
Ballot	1					
EVM	.56**	1				
ATM (Kiosks)	.023	.095	1			
Phones	-0.3**	-0.26**	.117	1		
Computers	-0.43**	-0.37**	.013	.5**	1	
SMS	-0.28**	-0.44**	-0.001	0.48**	0.47**	1

**Correlation is significant at 0.01level (1 tailed)

Table 2: Correlations Between I-Voting Characteristics And Preference Scores

Characteristic	*PPS*	*IPS*
Reduction in Counting Errors	-0.318**	0.204**
Reduction in Effort	-0.237**	0.220**
Improvement in Security	-0.244**	0.265**
Reduction in Unethical Practices	-0.164**	-0.228**
Insecurity of the Internet	0.237**	-0.209**

**Correlation is significant at 0.01level (1 tailed)
* Correlation is significant at 0.05level (1 tailed)

According to the results, 57% of the respondents indicated that the inherent insecurity of the Internet would be highly influential when it comes to choosing Internet Voting over Poll based methods. As shown in Table 2 Internet Voting methods have a significant negative correlation with this characteristic whereas the Poll based methods have a significant positive correlation. The presence of these issues suggests that instead of replacing the ballot based voting methods altogether Internet Voting could serve as a very effective alternative provided the perceived vulnerabilities of the Internet are taken care of. The mean values of PPS_i for overseas Pakistanis, voters with constituency different than their city of residence, and non-voters are 0.5, 0.47, and 0.44 respectively. For the same groups of voters the mean values of IPS_i are 0.7, 0.69, and 0.71 indicating a higher preference for Internet Voting.

The survey also revealed that 1) Lack of trust in the electoral system and 2) Issues in travelling to the designated constituency, were two of the major causes for not opting to vote. In the survey the two characteristics: Reduction in counting errors and Reduction in unethical practices were assigned very high scores indicating that the errors in counting and unethical practices could be reduced and public trust on the voting system could be improved by using Internet Voting methods. The characteristic: Reduction in effort also received high scores indicating that Internet Voting could address the issue of effort and hence high travelling costs. As Internet Voting can potentially solve most common problems faced by non-voters, we can say that the use of Internet voting methods can increase the voter turnout in Pakistan.

5. CONCLUSIONS

The voter turnout in Pakistan has been on decline on the average in the general elections. This study was focused on identifying whether Internet Voting would increase the turnout of educated voters in Pakistan. A survey was conducted among the educated voters to determine their preference of voting methods and the reasons for abstaining from voting in elections. It was found that the participants preferred Internet Voting over the traditional voting methods. Additionally, the common reasons for not voting were the lack of trust in the electoral system and high traveling effort which could be solved through Internet Voting methods. These facts lead us to conclude that Internet Voting can be instrumental in increasing the turnout of educated voters. It can also lead to an efficient and lean voting system and hence a smarter government.

In future the study can be extended to increase the participation from all age groups, other provinces, and voters having no or little technology background.

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