Artificial Intelligence-based SMS Voting in Afghanistan: Past and Future Prospects

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by Wasal Naser Faqiryar

EXECUTIVE SUMMARY

Since the Taliban takeover of Afghanistan in the summer of 2021,[1] among the many open questions about the country's future is whether elections will ever be held again. If so, the newly re-christened Islamic Emirate can learn from the mistakes of its predecessor, the Islamic Republic, in terms of how to conduct an election. The previous government was either unable or unwilling to deal with the widespread fraud and corruption that marred its elections and, over the course of two decades, eroded Afghan public trust in the electoral process.

What the Islamic Republic could have done to promote accountability and transparency in voting, and what the Islamic Emirate could still do in the future, is to make use of modern information communication technology. Mobile voting applications or portable voting devices were and will continue to be unaffordable, inaccessible and probably alien to many Afghan households, but not SMS voting. Implementing an artificial intelligence-based SMS voting system would increase security, privacy, participation – especially of women – and transparency, all the while making use of two realities in Afghanistan. First, the vast majority of Afghans own mobile phones and are familiar with texting. Second, even old mobile devices with GSM mobile coverage would be sufficient for casting a digital ballot.

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[1]   This policy brief was originally written before the Taliban takeover. It has been subsequently adapted to the new political reality inside Afghanistan.

Elections 2004-2021

A new era of democratic engagement in Afghanistan began with the presidential election of 2004 that brought an end to the interim government established by the United States and its allies following their invasion in 2001. Until the collapse of the Islamic Republic during the summer of 2021, attempts were made to establish an election system using modern technology, but to little avail. Telecommunication infrastructure in Afghanistan was patchy, and many Afghans themselves were unfamiliar with e-voting, to say nothing of the high proportion of voters who lived in undeveloped and quite distant rural areas (nearly 74 percent in 2020[2]), which posed serious hurdles to voter registration, identity certification and vote tallying.[3] Endemic fraud in elections also eroded Afghans' belief in 'free and fair' and genuinely representative elections.[4]

From the start, Afghan voters had to contend with political violence in order to participate in elections, dying in explosions and having their index fingers (which they used to vote) cut off by the Taliban. Despite this, many voters persevered and cast their ballots.[5] What caused the electoral process in Afghanistan to lose its legitimacy and cause increasingly lower turnouts was not terrorism, but systemic fraud.[6]
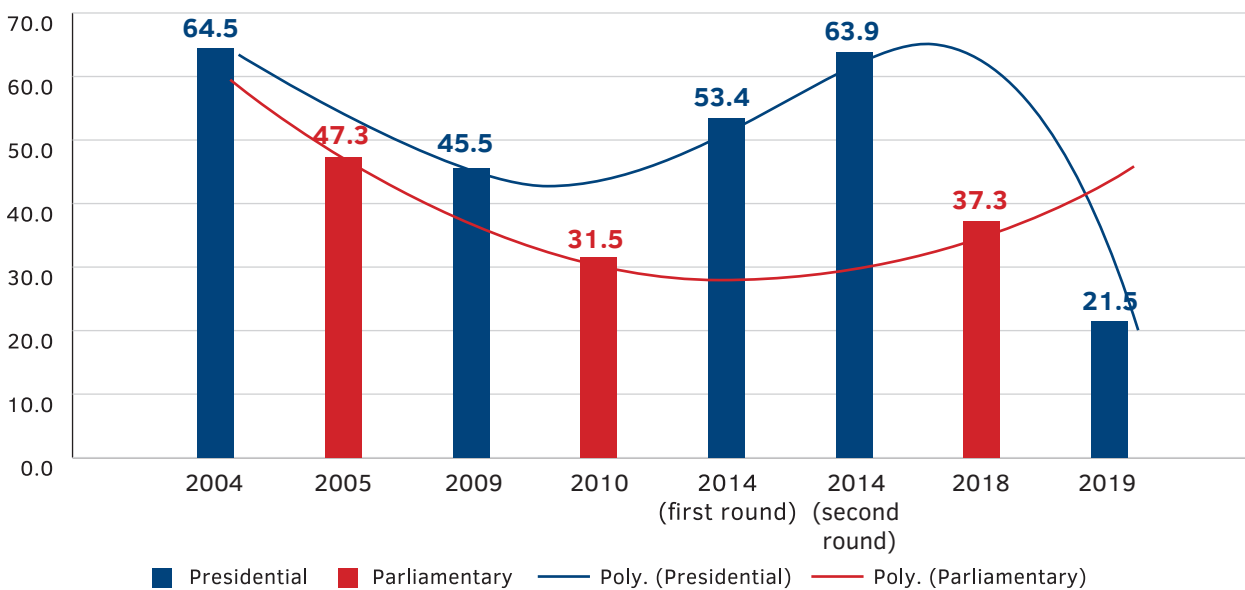
Voter Turn Out

Chart 1: 2004 – 2019 Presidential and Parliamentary Voter Turnout Statistics

2   Trading Economics, '*Afghanistan-Rural Population*,' Corporate website, accessed 11 November 2021, https://tradingeconomics.com/afghanistan/rural-population-percent-of-total-population-wb-data.html.

3   'E-Voting System Not Practical in Afghanistan: Task Team,' *TOLOnews*, last modified 20 April 2017, accessed 11 November 2021, https://tolonews.com/afghanistan/e-voting-system-not-practical-afghanistan-task-team.

4   Thomas H Johnson, 'The Myth of Afghan Electoral Democracy: The Irregularities of the 2014 Presidential Election,' *Small Wars & Insurgencies* 29, no. 5–6 (2018): 1006–39.

5   Abdul Qadir Sediqi, 'The Taliban Cut off His Finger for Voting, He Defied Them Again,' *Reuters*, last modified 28 September 2019, accessed 11 November 2021, https://www.Reuters.com/article/us-afghanistan-election-voter/the-taliban-cut-off-his-finger-for-voting-he-defied-them-again-idUSKBN1WD09I.

6   Special Inspector General for Afghanistan Reconstruction, 'Elections: Lessons from the U.S. Experience in Afghanistan,' accessed 11 November 2021, https://www.sigar.mil/pdf/lessonslearned/SIGAR-21-16-LL.pdf.

7   The chart was created by combining data from the following two sources: Afghanistan Election Data, 'Afghanistan Election Data: The National Democratic Institute 2018,' accessed 21 May 2021, https://afghanistanelectiondata.org (the website has been inactive since August 2021, but can still be accessed via Archive.org: https://web.archive.org/web/20210617063916/https://afghanistanelectiondata.org/); Independent Election Commission of Afghanistan, 'Voter Registration Statistics,' Corporate website, last modified 01 July 2019, accessed 11 November 2021, https://www.iec.org.af/en/stakeholders/voters/vr-statistics.

Conservative resistance to modern democratic elections,[8] coupled with the bitter political settlement of 2014,[9] in 2016, the Afghan government sought to implement reforms to the electoral process.[10] Among the changes, to combat double and underage voting, a biometric voter verification system was introduced ahead of the parliamentary election scheduled for October 2018.[11] This system was designed to use fingerprinting and photographs of each voter.[12] The Independent Election Commission (IEC), in partnership with the National Statistics and Information Authority, obsoleted the old system of voter registration cards and made it mandatory for voters to re-register using their tazkira (Afghan Citizenship Identity Card).[13] The back of every tazkira was then marked with a voter registration sticker as proof of voting eligibility, while essential details of each voter were recorded in an electoral registry. Legally, voters were also told to vote on election day only from the center where their details were registered.[14]

The introduction of biometrics backfired, sparking discontent among both candidates and voters in the 2018 parliamentary elections. Technical issues and the absence or malfunction of biometric devices led to 13,000 voter complaints filed nationwide.[15] Delays were also caused in some polling stations due to a lack of prior staff training in how to use the devices, as well as battery shortages. Were all this not enough, election logistical materials were lacking, and voter registration forms were frequently incomplete,[16] while some polling stations were either closed for hours or did not open until the day's end.[17]

The IEC unsuccessfully attempted to avoid repeating these problems in the presidential election of 2019. Worse yet, there were hacking

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8   Ali Yawar Adili and Martine van Bijlert, 'Afghanistan's Incomplete New Electoral Law: Changes and Controversies,' Afghanistan Analysts Network, last modified 22 January 2017, accessed 11 November 2021, https://www.afghanistan-analysts.org/en/reports/political-landscape/afghanistans-incomplete-new-electoral-law-changes-and-controversies/.

9   The National Unity Government was formed in 2014 under a power sharing political settlement between Ashraf Ghani and Abdullah Abdullah, the two final round presidency rivals. Both men were complaining of widespread fraud but only Abdullah's party declared rejection of the election results. To end the political stalemate, the United States intermediated diplomatically, solving the halted announcement of election results and making both parties accept the final tally and come up with a political settlement. Subsequently, Ghani was declared as President and Abdullah as Chief Executive.

10   Ali Yawar Adili and Martine van Bijlert, 'Afghanistan's Incomplete New Electoral Law: Changes and Controversies,' Afghanistan Analysts Network, last modified 22 January 2017, accessed 11 November 2021, https://www.afghanistan-analysts.org/en/reports/political-landscape/afghanistans-incomplete-new-electoral-law-changes-and-controversies/.

11   Report of the Secretary General, 'The Situation in Afghanistan and Its Implications for International Peace and Security,' United Nations Assistance Mission in Afghanistan, last modified 07 December 2018, accessed 11 November 2021, https://unama.unmissions.org/sites/default/files/sg-report-on-afghanistan-7-december-2018.pdf.

12   Farangis Najibullah and Freshta Neda, 'Biometrics To End Fraud In Afghan Election May Discourage Some Women From Voting,' Gandhara, last modified 27 August 2019, accessed 11 November 2021, https://gandhara.rferl.org/a/biometrics-to-end-fraud-in-afghan-election-may-discourage-some-women-from-voting/30131863.html.

13   Formerly known as Afghanistan's Central Civil Registration Authority (ACCRA).

14   Thomas H Johnson and Ronald J Barnhart, 'An Examination of Afghanistan's 2018 Wolesi Jirga Elections: Chaos, Confusion and Fraud,' Journal of Asian Security and International Affairs 7, no. 1 (2020): 57–100; Staffan Darnolf and Scott S Smith, Breaking, Not Bending: Afghan Elections Require Institutional Reform (United States Institute of Peace, 2019), accessed 11 November 2021, http://www.jstor.org/stable/resrep20242.

15   European Country of Origin Information Network, 'British and Irish Afghanistan Group. Afghanistan in October 2018,» Corporate website, accessed 11 November 2021, https://www.ecoi.net/en/file/local/1456974/1226_1548665626_atm-october-2018.pdf.

16   Staffan Darnolf and Scott S Smith, Breaking, Not Bending: Afghan Elections Require Institutional Reform (United States Institute of Peace, 2019), accessed 11 November 2021, http://www.jstor.org/stable/resrep20242.

17   Thomas H. Johnson and Ronald J. Barnhart, 'An Examination of Afghanistan`s 2018 Wolesi Jirga Elections: Chaos, Confusion and Fraud,' Journal of Asian Security and International Affairs 7 no. 1 (2020): 57–100.

attacks against the IEC servers that stored and analysed the data from biometric devices. Although quite fortunately, these attacks were neutralized by the German manufacturer of the devices,[18] all of these problems nonetheless provoked the need for a political settlement in May 2020.[19]

SMS Voting

A veritable army of observers all noted the failings of the Islamic Republic's electoral system.[20] Now that this government has been swept from power, the question arises: what could have worked – and if the newly re-christened Islamic Emirate decides to conduct elections, what could still work in the future? The answer may very well be to use mobile devices. More precisely, not mobile applications and portable voting devices, but rather a combination of artificial intelligence with short message services (SMS), otherwise known as text messaging.

Apps and portable voting devices were and will continue to be unaffordable, inaccessible and probably alien to a majority of Afghan households, but not so for SMS voting. Of Afghanistan's estimated 39.38 million citizens, only 8.64 million are active internet users,[20]

and barely any of these either use or have any familiarity with smartphones.[22] Smartphone usage not only indicates a person's ability to use apps, but is a decent indicator for whether a person will be able to use a portable voting device. The story is very different for the Global System for Mobile Communications (GSM), which has deeply penetrated Afghanistan. According to the Afghanistan Telecom Regulatory Authority, in 2020 approximately 90 percent of residential areas had 2G network coverage, and crucially, there were approximately over 35 million GSM subscribers, i.e., 88.87 percent of the population.[23] To further underline the point, this statistic stood in stark contrast to those with 3G and 4G coverage: only 5.97 million and 1.45 million users, respectively. So, GSM was, and will likely continue to be for some time.

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[18] Thomas Ruttig, Jelena Bjelica, and Ali Yawar Adili, 'Afghanistan's 2019 Election (21): BVV Devices and a Delay in Announcing Preliminary Results,' Afghanistan Analysts Network, last modified 25 October 2019, accessed 11 November 2021, https://www.afghanistan-analysts.org/en/reports/political-landscape/afghanistans-2019-election-21-bvv-devices-and-a-delay-in-announcing-preliminary-results/.

[19] The High Council of National Reconciliation was formed on May 17, 2020 under another power sharing political settlement between Ashraf Ghani and Abdullah Abdullah, the two old rivals to end political deadlock. Under this deal, Abdullah leads peace negotiations with the Taliban and Ghani remains as president.

[20] Staffan Darnolf and Scott S Smith, *Breaking, Not Bending: Afghan Elections Require Institutional Reform* (United States Institute of Peace, 2019), accessed 11 November 2021, http://www.jstor.org/stable/resrep20242; Martine van Bijlert, 'Electoral Reform, or Rather: Who Will Control Afghanistan's next Election?' Afghanistan Analysts Network, last modified 17 February 2015, accesses 11 November 2021, https://www.afghanistan-analysts.org/en/reports/political-landscape/electoral-reform-or-rather-who-will-control-afghanistans-next-election/; Jonathan Goodhand, Astri Suhrke, and Srinjoy Bose, 'Flooding the Lake? International Democracy Promotion and the Political Economy of the 2014 Presidential Election in Afghanistan,' Conflict, Security & Development 16, no. 6 (2016): 481–500; Frances Z Brown, *Local Governance Reform in Afghanistan and the 2018 Elections* (United States Institute of Peace, 2017), accessed 11 November 2021, http://www.jstor.org/stable/resrep20212; Colin Cookman, 'Notes.' *Assessing Afghanistan's 2019 Presidential Election* (United States Institute of Peace, 2020), accessed 11 November 2021, http://www.jstor.org/stable/resrep26060.10; Michael O'hanlon, 'Improving Afghanistan Policy,' *The Foreign Policy Brief Brookings* 2, no. 1 (2016): 1–8, accessed 11 November 2021, https://www.brookings.edu/wp-content/uploads/2016/07/afghanistan_policy_ohanlon-2.pdf .

[21] Simon Kemp, 'Digital 2021: Afghanistan,' DataReportal, last modified 11 February 2021, accessed 11 November 2021, https://datareportal.com/reports/digital-2021-afghanistan.

[22] Mohammad Asif Habibi, Milos Ulman, Bahawodin Baha, and Michal Stoces, 'Measurement and Statistical Analysis of End User Satisfaction with Mobile Network Coverage in Afghanistan,' *Agris On-Line Papers in Economics and Informatics* 9 (2017): 47–58.

[23] Ministry of Communications and IT of Islamic Republic of Afghanistan: Afghanistan Telecom Regulatory Authority, 'Telecom Statistics Q4 – 2020,' Corporate website, accessed 11 November 2021, https://atraapi.weboona.com/media/documents/Statistics_Q4_2020_9e3627y.pdf.

Not only is SMS voting better suited to Afghanistan's infrastructure and technological habits, but Afghans are also quite familiar with the concept. Since 2005, Tolo TV has broadcasted 'Afghan Star', essentially Afghanistan's version of 'Pop Idol', and one of the country's most popular television shows.[24] Viewers vote for contestants via text messages, it is believed that far more people voted in the 2019 season of the show than in the presidential election that year.[25]

Political corruption was the real problem undermining the Islamic Republic's elections. It must be said clearly that no voting technology can solve human rights violations like intimidation, or election engineering like vote buying. Nevertheless, as far as the problems with voting technology were specifically concerned, the solution was staring everyone in the face and was quite straightforward: citizens could have voted by SMS.

So far, SMS voting has been tried in Bangladesh.[26] The idea can be met with skepticism because it is in principle easy to commit fraud with text messages. To protect against this very real possibility, there are ways to deploy artificial intelligence to vet SMS votes. Some of those ways will be outlined in the recommendations below.

Recommendations

If the new government led by the Taliban intends to conduct elections in the future, they can learn from the mistakes and missed opportunities of their predecessors by implementing artificial intelligence-based SMS voting. The system could generally look like the following, and of course security, privacy and counter-fraud improvements can and should be made if these recommendations prove insufficient:

- A system of e-ID cards and an encrypted database that compiles not only citizens' biometric and residency data, but also their mobile devices, e.g., their Subscriber Identity Module (SIM) numbers. This information will be used for voter registration. Note that SIM numbers must be made non-transferable, even after death. Preferably, the database should use differential privacy and other forms of encryption, as well as permit security audits by neutral third parties, to ensure privacy of the electorate.

- The IEC assigns a unique numeric code to each candidate running for office. All codes are provided to voters publicly. Using text messages, an artificial intelligence-based program sends each eligible voter a unique and random 10-character number, for the purpose of sending favorite 'candidate's unique numeric code' to the 'random 10-character number' as the mechanism of casting a vote. The program tallies these votes and, depending on whether the government considers it prudent to do so, broadcast the results live.

- Duplicate backup servers are used to prevent overload and distributed denial of service (DDoS) attacks, as well as to ensure votes are not lost in the event of blackouts or technical failures. Transfers of votes to a central compilation system will be done via blockchain; this system will also have duplicate backup servers.

24 Aryn Baker, 'Afghan Idol: A Subversive TV Hit,' Time, last modified 24 May 2008, accessed 29 October 2021, http://content.time.com/time/world/article/0,8599,1725113,00.html.

25 'Afghanistan's thriving television channels prepare for a crackdown,' *The Economist*, last modified 4 September 2021, accessed 29 October 2021, https://www.economist.com/asia/afghans-thriving-tv-networks-prepare-for-a-crackdown/21804084.

26 M. Kamaraju, Subba P.V, and Venkata Thota, 'A Novel Voting System Using SMS,' *Computer Science & Information Technology* 3 (2013): 297–303; Chowdhury Mushfiqur Rahman, 'Study of SMS Security As Part of an Electronic Voting System,' Bachelor thesis, (BRAC University, 2006), accessed 11 November 2021, https://core.ac.uk/download/pdf/61800546.pdf.

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