Will we opt_in?: How tomorrow's computing may transform democracy

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Summary

"Will we opt_in?: How tomorrow's computing may transform democracy"

Our essay begins in the year 2034, where a new technology suite called 'opt_in' has allowed for rapid democratization. Four scenarios examine opt_in's potential impact on individuals in the United States and India, the two largest democracies in the world. The essay then describes the theory behind opt_in and discusses its potential implications from the standpoint of its hypothetical development today.

opt_in is imagined as the primary platform to be used for electoral processes and the expansion of democratization. The technology includes a host of functionalities tailored for different democracy-inducing procedures, operating as the epitome of the confluence of computing technology and sociopolitical institutions. It is fundamentally structured around a blockchain system, with its additional tools implementing technologies such as remote sensing. Envisioned to be among its primary proprietary/named functionalities are PlebiSite, SmartSocialContracts, SensUs, and DataLocke, with each providing a unique application of an aspect of computing technology towards the advancement of novel democratic procedures and institutions.

With the potential applications of computing technologies, opt_in represents a possibility for the use of technologies such as blockchain and remote sensing for immense good: it provides a platform for secure, invulnerable, and convenient polls that encourage direct democracy with automatically enforceable results, as well as the means to increase democratic reach to areas and communities that may have historically faced difficulties in getting to the ballot box. Through these functionalities, opt_in represents an ideal scenario in which computing and technological advances may be used for democratization and for good. OPTs like opt_in have the potential to bring about a revolution in our understanding of democracy and governance, allowing for a more inclusive, secure, direct, and convenient means for expressing the popular will.

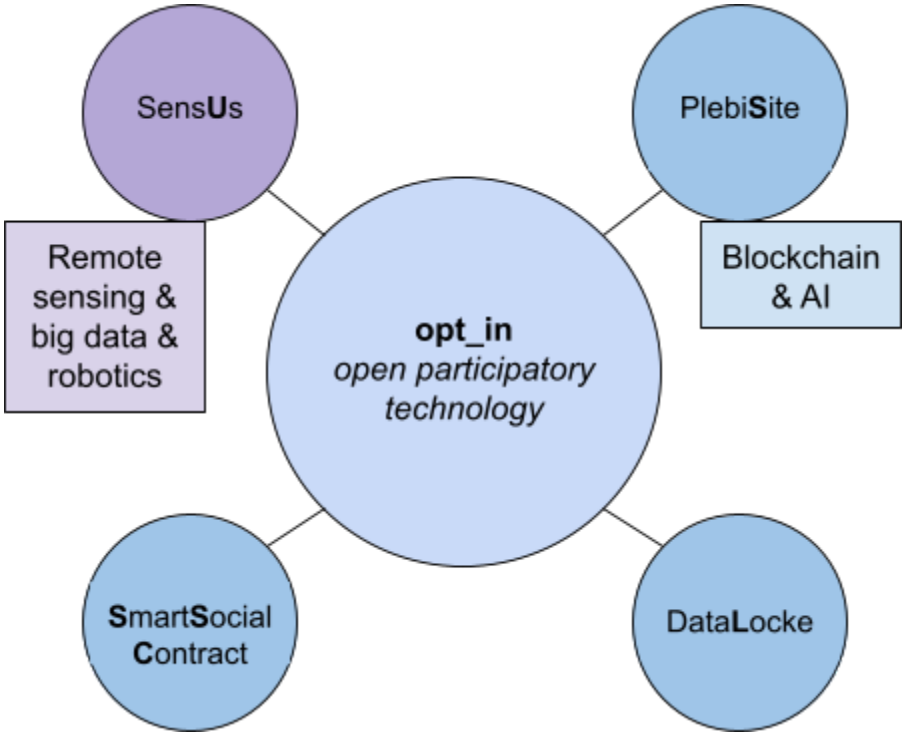
Will we opt_in?

How Tomorrow's Computing May Transform Democracy

Image credit: Bing Image Creator, using the prompt: "A family in a remote village uses their smartphone to vote for the first time, depicted as a page from a sketchbook" (2024).

– Year 2034 –

The emergence of open participatory technology (OPT) has transformed the world. opt_in, the only OPT package at scale, is essentially a suite of tools to further democratic governance. Powered by blockchain, AI, and remote sensing, opt_in provides digital voting and surveying services. It's been less than a year since the launch. But the penetration rate of opt_in has been rapid: thousands of cities and dozens of countries are using it to enable various forms of civic engagement. Though voting has never been more convenient and decision-making has never been closer for countless communities, the formation of new electorates and the technical reach and decentralization of opt_in services have worried many people, even to the point of violent clashes. Some researchers wonder if opt_in was released hastily and without adequate safeguards. Still, activists argue that democracy delayed to people is democracy denied.



A schematic of opt_in's current suite of technologies.

Northeastern India

Santosh has grown so accustomed to his biannual trip into the depths of Mizoram's forests, that as he readies his pack for the last time this year, he worries that he might come to miss it. For more than a decade, Santosh has been part of a team that takes part in the world's largest electoral demonstration, traveling for days to the most remote villages and scheduled tribal communities in India's northeast with paper ballots, indelible ink, and ballot boxes to ensure that the maximum number of people can participate in India's regular regional and national elections. However, with the rapid expansion of opt_in and India's plans to embrace it for all elections from local to parliamentary, Santosh knows that this will likely be his last physical trek out to the villages he's come to know over the years.

As he zips up his pack and heads out the door towards his truck, Santosh and the rest of the team plan to review the information sheets they are set to distribute to citizens in Mizoram's villages, explaining opt_in and its functionalities. As saddened as he is by the thought that this may be his last time greeting the villagers he's befriended, he is all the more hopeful that the mission he's devoted years of his life to – expanding electoral access to those in remote communities – is about to witness a long-anticipated explosion of growth. Not only will opt_in allow for those in the most remote of areas to vote on issues beyond those that appear on the periodic regional and national biannual ballots, but it will also allow for easier access and reduced resources for widespread enfranchisement. And through its SensUs functionality, all

those, including those in the most remote of areas that even Santosh had been unable to reach, might soon be able to participate in the electoral process: specifically, SensUs will use remote sensing to detect where people are in unsurveyed areas and provide that data to local officials, who can then see if those constituents want to be connected to opt_in's voting features via free WiFi or autonomous drones. With this in mind, Santosh folds up the info sheet and puts it in his pocket, smiling as he turns the key to his truck.

Northeastern United States

It's 9pm as Lisa boards the Red Line – she's just finished her workday in Boston's financial district and commutes home. As she gets off at her stop and sifts through the crowds at the station, she makes her way toward the local mom-and-pop grocery store on the block to buy some ingredients for a quick dinner. As part of her usual routine, Lisa makes her way down the street and through the small, cluttered aisles of the store without putting much thought into her actions. Her phone buzzes with a notification:

> **opt_in**
> ***REMINDER****: You have 2 hours remaining to complete today's PlebiSite from Boston City Council: ENACTMENT OF SUBSIDY PROGRAM IN SUPPORT OF COMMUNITY-CENTERED SMALL BUSINESSES*

Lisa recalled eyeing the notice for today's poll earlier in the day but had been unable to find time to submit her vote during her long hours at work. Putting her phone back in her pocket, she picked something out from the freezer and made her way to the counter, still thinking of the poll. As she pulled out her wallet, she asked the person at the counter – the cashier, the manager, and the owner all at once – if he knew anything about the subsidy program that was being voted on today. "Well, when I started this store, I took out a low-interest loan from the city. Without it, me and my family wouldn't have been able to get started with our own business. Ever since then, we've received a lot of support from the community and city, but with everything going on and times getting tough, we worry about being pushed out by those bigger stores and whether we can continue…"

As their conversation continued, Lisa slowly came to a better understanding of the issues at hand. As she pushed open the door to leave, she grabbed her phone and clicked on the same notification as before, submitting her vote on opt_in as she made her way home.

Western India

It's a national election year and the political contest has gotten especially contentious. The incumbent party and candidate have been leading the polls, but have been accused of

tightening their grip on power and bypassing certain democratic channels. Jamila is a prominent influencer who gained a platform calling for improved minority rights across the country – criticizing leading policies – as well as campaigning for voter access in rural communities. When news of opt_in swept in, she was one of its biggest supporters. In many vlogs she embraced the ad_opt, even becoming recognized by the opt_in_foundation as one of Asia's democracy champions. However, she soon got labeled by the leading party as a 'foreign agent' and her non-profit suddenly received a litany of trumped-up charges. Surprisingly, the leading party has also been a swift proponent of opt_in technology… but with a major caveat. This major election will be conducted entirely via PlebiSite, but some states have ruled against using SensUs capabilities beforehand and a new law was just passed that says that the timeframe of vote collection will be unchanged from the current paper ballot system.

In the lead-up to the election, Jamila notices that load shedding has become common in certain areas and several projects for electrification and digital access in minority communities have been delayed. Additionally, social media seems flooded with conflicting, AI-generated messages about how to register for PlebiSite. Jamila is outraged. She takes to X and voices her opposition:

> "opt_in is supposed to promote democracy. But today its digital nature is being taken advantage of to stifle democracy. Our beloved 🙄 rulers are planning to use #OPTwashing to cover up massive voter suppression."

A few days later, Jamila starts a campaign called 'opt_out,' lamenting the propaganda and the state's ability to restrict internet and electricity, which may end up reducing voting access to the very communities she hoped opt_in would benefit.

Midwestern United States

Standing in the box atop the crane, Lando waits as his partner slowly lowers him down. He had just finished repairing an electricity line on a utility pole and was getting ready for a long day of repairs following a heavy storm the night before. As they get into their truck, Lando's partner asks, "Did you hear about that attempted cyberattack on the electric grid last week?" Lando, not having heard of the news, readies himself to launch into one of his well-versed tirades on the failures of the country's cybersecurity system – those around him often found Lando alleging covert, malign foreign interference in everything from the financial system to presidential elections. His partner was quick to cut him off however; the cyberattack had been averted. Lando, confused, was told that it had largely been thanks to the utility system's shift a few months ago towards "some type of decentralized blockchain," allowing it to fend off any potential antagonistic actions.

Having heard that, Lando got to thinking – he knew the phrases his partner had thrown around sounded familiar. In fact, he had heard those same terms used for opt_in's DataLocke feature – a blockchain-reliant system that employs aspects of a decentralized and cryptography-coded system to ensure the privacy and security of individual data and the system as a whole. With his long-standing suspicions of the security and independence of the election process, Lando had initially been disillusioned by opt_in when he first heard of it and dismissive of its claimed safeguards. But now, he began to think, "I wonder how this blockchain security for opt_in actually works? I mean, after all, the same technology did prevent that attack last week…"

– Year 2024 –

Today, ten years before the launch of opt_in, there is a growing movement toward technology that can further democracy that reaches all. People have coined terms such as "e-Democracy"[1] and "Democracy 2.0"[2] to describe the integration of AI, blockchain, and other tools into voting and participatory systems. Technology can distribute and concentrate power. The former is possible through secure digital channels that are transparent and accessible. OPT has a mission to follow this path, despite the obstacles posed by anti-democratic polities, data breaches, and deception.

opt_in is an envisioned upcoming OPT technology and the primary platform to be used for democratic governance undertakings, such as electoral processes. The technology includes a host of functionalities tailored for different democracy-inducing procedures, operating as the epitome of the confluence of computing technology and sociopolitical institutions. It's fundamentally structured around a blockchain system, with its additional tools implementing technologies such as remote sensing. Envisioned to be among its primary proprietary/named functionalities are PlebiSite, SmartSocialContracts, SensUs, and DataLocke, with each providing a unique application of an aspect of computing technology towards the advancement of novel democratic procedures and institutions.

PlebiSite

PlebiSite represents opt_in's primary focus on radically expanding democratic procedures through the implementation of a digital, easy-access voting platform. PlebiSite operates on a

[1] "E-Democracy." Encyclopædia Britannica. Accessed February 4, 2024. https://www.britannica.com/topic/e-democracy.

[2] Nave, Kathryn. "Democracy 2.0: How Blockchain Technology Is Unveiling a New Type of Democracy." Dell, December 27, 2017. https://www.dell.com/en-us/perspectives/democracy-2-0-how-blockchain-technology-is-unveiling-a-new-type-of-democracy/.

blockchain system, where each voter's electronic device comprises a node on opt_in's decentralized network. In the event of an election or referendum, as each vote is cast, it is recorded as a transaction on the blockchain, time-stamped and tamper-proof to provide an unalterable and secure record of the vote.[3] The secure and verifiable nature of PlebiSite's blockchain-based network presents a principal benefit of opt_in's voting functionality in terms of reputability and protection from vulnerabilities. Biometric authentication is not necessarily needed but could augment security in certain contexts, while also presenting greater privacy concerns. Guiding prompts and educational information are generated via AI on the platform so that they are linguistically and culturally appropriate.

Additionally, PlebiSite's existence as a safe, secure, and invulnerable means of submitting and tallying individual votes, coupled with its platform on an individual's electronic device, greatly expands the scope and ease of democratic voting. With the ability to vote securely from one's electronic device, democratic processes are no longer limited by variables such as expensive resources and complicated logistics for the organizations of polls or time constraints that individual citizens may face – instead, democratization can take place on a variety of issues of all scales.[4] In a present-day representative democratic system, this could include exercises such as the population-sized surveying of constituents to gauge popular stances on certain issues.

However, the benefits of PlebiSite's technology when it comes to ease and security in voting and the reduction of required resources can also allow for the radical democratization and restructuring of our political systems. PlebiSite can bring about fully inclusive plebiscites or referendums on issues on a variety of scales: that is, it has the potential for the effective implementation of direct democracy (rather than representative democracy). PlebiSite can eliminate the obstacles towards a present-day implementation of direct democratic procedures to decide laws, allowing citizens themselves to vote on any given bill directly, rather than their representatives who would typically do so for them.[5]

However, potential pitfalls do exist from this technology. As seen in the case with Jamila, potential governmental restrictions or cyberattacks not on the blockchain system itself, but rather on internet or electricity access may result in reduced access to voting mechanisms on an

[3] Stanford Online. How does blockchain work? Accessed February 5, 2024. https://online.stanford.edu/how-does-blockchain-work.
[4] European Parliamentary Research Service. "Blockchain Voting." YouTube, September 19, 2018. https://www.youtube.com/watch?v=2rgbOv_ab4c.
[5] Vision, Poetic. "Democracy 2.0: Implementing Direct Democracy & True Decentralization of Power via Smart Contracts." Medium, October 30, 2022. https://medium.com/@ruffsanti/democracy-2-0-implementing-direct-democracy-true-decentralization-of-power-via-smart-contracts-580591861db3.

all-digital platform. PlebiSite's reliance on the Internet for transactions may present a weak point for malicious actors seeking to prevent votes in certain areas from taking place.

SmartSocialContracts (SSCs)

As opt_in envisions it, SmartSocialContracts (SSCs) are the natural evolution and digital world equivalent to John Locke's social contract. In Locke's traditional social contract theory, citizens enter into implied contracts with their governments, where the former agree to give up certain freedoms (by being subject to laws) in exchange for the protection of their other rights and the enforcement of order by the latter.[6]

In this reimagining of Locke's social contract, SmartSocialContracts are structured in a similar way as standard blockchain "smart contracts": they are deployed on the decentralized PlebiSite blockchain network and are automatically executed and enforced once predetermined terms of the contract are met.[7]

Much like Locke's social contract, SSCs exist between government officials and citizens. However, with the ability for PlebiSite to reimagine our societal democratic frameworks, SSCs would instead posit that government officials respect the results of PlebiSite referendum results and that the result is automatically executed to become law. That is, government officials, upon announcing that a referendum on a certain bill will take place, enter into a smart contract with voters on the blockchain network, which states that the results of the referendum, no matter what they are, are to become law.[8] As with any blockchain smart contract, these results are automatically executed and enforced upon completion of the referendum.

The SSC system serves to ensure that the will of the people will be instituted – through the automatic execution mechanism of smart contracts, it provides a means of enforcing direct democracy and preventing forces that may seek to undermine or prevent laws from passing despite the will of the majority.[9] That is, any efforts to change the vote or prevent its enforcement upon its completion would be nullified. With existing modern-day issues regarding attempts of government officials to prevent the enforcement of popular votes – such as

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[6] "Social Contract." Encyclopædia Britannica, January 1, 2024. https://www.britannica.com/topic/social-contract.
[7] Szabo, Nick. "Smart Contracts." Smart Contracts | Satoshi Nakamoto Institute, 1994. https://nakamotoinstitute.org/smart-contracts/.
[8] Canada, Alberto Cuesta. "Blockchain Democracy." Medium, May 7, 2020. https://medium.com/swlh/blockchain-democracy-932b969d1cc5.
[9] Vision, Poetic. "Democracy 2.0: Implementing Direct Democracy & True Decentralization of Power via Smart Contracts." Medium, October 30, 2022. https://medium.com/@ruffsanti/democracy-2-0-implementing-direct-democracy-true-decentralization-of-power-via-smart-contracts-580591861db3.

filibusters to prevent votes from taking place or attempted insurrection after popular votes – SSCs plausibly solve a pressing issue regarding the undermining of democratic will.

DataLocke

DataLocke is opt_in's unique security mechanism to protect the data, privacy, and personal information of its users and voters, while simultaneously not compromising on any transparency in transactions or lucidity in the ongoings of the voting process.

DataLocke operates and takes advantage of standard aspects of blockchain technology: in order to maintain security and the protection of privacy (such as the voting history and personal information of individuals), nodes in the PlebiSite blockchain network employ public-key cryptography, using both a private-key for signing each transaction/vote and a public-key for verification.[10]

Furthermore, while transparency is a necessity in the opt_in voting system – to dispel any potential fears about the objectivity and independence of the voting process – the anonymity of voter identities is simultaneously ensured through confidential transactions. One way this may be done is through a series of ring signature formats that conceal the identity of the voter corresponding to any given private key,[11] as well as default stealth addresses employed by the blockchain system to provide additional layers of anonymity.[12]

Preserving the privacy and anonymity of users on opt_in is a necessary functionality to maintain trust in the democratic frameworks of the OPT. The risk of compromise in such personal data such as voting history may result in the targeting of individuals or improper use of their personal information.

SensUs

Whereas opt_in's previous functionalities largely focus on the security, enforcement, and directness of democratic practices, SensUs is another tool within opt_in's suite with a related but somewhat disparate focus. SensUs aims to increase democratization through the physical expansion of democratic processes to areas that have been historically marginalized or faced barriers to the physical voting process.

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[10] Mark. "Public Key & Private Key: A Detailed Guide." Mycryptopedia, May 23, 2023. https://www.mycryptopedia.com/public-key-private-key-explained/.
[11] "Moneropedia: Ring Signature." getmonero.org, The Monero Project. Accessed February 4, 2024. https://www.getmonero.org/resources/moneropedia/ringsignatures.html.
[12] "Moneropedia: Stealth Address." getmonero.org, The Monero Project. Accessed February 4, 2024. https://www.getmonero.org/resources/moneropedia/stealthaddress.html.

SensUs largely does this through remote sensing and big data technologies. Through opt_in's own fleet of satellite and sensor technologies, SensUs employs remote sensing to detect and identify human settlements in remote areas[13] that may not have simple access to traditional forms of physical voting, as seen in Santosh's story. In the case of willingness on the part of people in these remote areas, opt_in can then provide the necessary technology – potentially via delivery by robotics/autonomous drone technology – for political participation and the enfranchisement of these communities, ensuring continued participation in electoral processes with minimal resources required.

Additionally, SensUs, by employing demographic population data alongside statistics on individual engagement with the opt_in platform, can identify certain population areas or communities with reduced civic and electoral participation rates through big data and other data analytic techniques. By identifying such "turnout deserts,"[14] opt_in can then take actions to encourage participation and engagement among such communities, furthering the spread of democratic processes to places that may have experienced historical marginalization.

Potential pitfalls and dangers do exist with SensUs – namely, for remote or disenfranchised communities dependent on such technologies for access to the vote, the choice to deploy or not deploy SensUs may be an intentional one, with the aim to leave them in or out of the electoral process for political reasons. Additionally, collecting macro-data on participation and turnout patterns by area or other broad non-identifying demographic variables may present a possible means for governments to unfairly target specific groups based on voting patterns.

– Conclusion –

In 2024, more than 60 countries around the globe are set to hold elections, with contests ranging from sham one-person rituals with pre-determined results to free and fair races with dozens of parties competing on the ballot.[15] Furthermore, in the United States, many have painted this upcoming election as one in which democracy itself may be at stake.[16] With the

[13] "What Is Remote Sensing and What Is It Used For?" What is remote sensing and what is it used for? | U.S. Geological Survey. Accessed February 4, 2024. https://www.usgs.gov/faqs/what-remote-sensing-and-what-it-used#:~:text=Remote%20sensing%20is%20the%20process,sense%22%20things%20about%20the%20Earth.

[14] Ali, Shirin. "The US Is Filled with Voter Turnout Deserts, Pushing Inequalities: Study." The Hill, August 11, 2022. https://thehill.com/changing-america/respect/equality/3597110-the-us-is-filled-with-voter-turnout-deserts-pushing-inequalities-study/.

[15] Ewe, Koh. "Elections around the World in 2024." Time, December 28, 2023. https://time.com/6550920/world-elections-2024/.

[16] "Remarks by President Biden on Standing up for Democracy." The White House, November 3, 2022. https://www.whitehouse.gov/briefing-room/speeches-remarks/2022/11/03/remarks-by-president-biden-on-standing-up-for-democracy/.

potential applications of computing, opt_in represents a possibility for the use of technologies such as blockchain and remote sensing for immense good: by providing a platform for secure and convenient polls that encourage direct democracy with automatically enforceable results, as well as the means to increase democratic reach to areas and communities that may have historically faced difficulties in getting to the ballot box, opt_in represents an ideal scenario in which computing and technological advances may be used for democratization and for good. OPTs like opt_in have the potential to bring about a revolution in our understanding of democracy and governance, allowing for a more inclusive, secure, direct, and convenient means for expressing the popular will.

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