Building a Democracy Machine:
Toward an Integrated and Empowered Form of Civic Engagement

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ABSTRACT

Dozens—and possibly hundreds—of online platforms have been built in the past decade to facilitate specific forms of civic engagement. Unconnected to each other, let alone an integrated system easy for citizens to use, these platforms cannot begin to realize their full potential. The author proposes a massive collaborative project to build an integrated platform called, tongue squarely in cheek, "The Democracy Machine." The Machine draws on public energy and ideas, mixing those into concrete policy advice, influencing government decision making, and creating a feedback loop that helps officials and citizens track progress together as they continuously turn the policymaking crank. This online system could help to harmonize civic leaders, vocal and marginalized citizens, and government. Democracy's need for ongoing public consultation would fuel the Machine, which would, in turn, generate the empowered deliberation and public legitimacy that government needs to make tough policy decisions.

ESSAY

America finds itself in the midst of a remarkable presidential election, which has just completed a high-stakes primary for both major political parties. Many conservative leaders continue to wrestle with a billionaire renegade for the future of the Republican Party, while young Democrats and Independents flocked to a self-described Democratic Socialist, who now leads an uncertain revolution within and beyond the Democratic Party. Social media and conventional media alike amplify the hum of political arguments and emotion that makes this year's election inescapable.

The stakes of the election are very real, and those who fight its battles are doing important work. Any country would be lucky to have an electorate generating so many Facebook posts and small donations. Voters have stood in too-long lines and caucus-goers have milled about for hours, just to ensure that their lone votes were counted among the million others. An apathetic public, this is not.

Even so, many voters have grown weary of the flash and yearn for more substance. In that sense, this moment represents a lost opportunity. Imagine if there had been a

way to channel all that civic energy into something beyond an election result. What if a larger fraction of the effort put into partisan advocacy were reinvested in learning that led to more enlightened collective judgment? When working out in gyms, I used to ponder how to convert all that exertion into electrical current. Modern machines now do exactly that, and it is only a matter of time until we find a way to channel political passion into a more effective process of self-government. We already have the technological means to do so, and if we hook these innovations together, we can build a powerful "Democracy Machine."

Saying that phrase—"Democracy Machine"—requires having one's tongue squarely in cheek. It is a metaphor more than a machine, and its moving parts are people connected through software, not gears and cogs. The "Machine" is a network of connections among online (and offline) interfaces and tools, all of which would gain power and purpose once coupled. Many of its components already exist, and some, like Peak Democracy's Open Town Hall, are already in wide use. Sites like Populus.org share technology to make it easier to replicate existing online civic tools, and platforms like D-CENT have moved in the direction of linking different civic activities across Europe.

Dozens—and possibly hundreds—of platforms like these have been conceived or built to address specific aspects of civic engagement. Unconnected to each other, let alone an integrated system easy for citizens to use, these platforms cannot begin to realize their full potential. This essay might help to bring the creators and users of such tools into a more focused conversation with one another, to build a more fully integrated civic platform.

The Democracy Machine's operation can be summarized as drawing on public energy and ideas, mixing those into concrete policy advice, influencing government decision making, and creating a feedback loop that helps officials and citizens track progress together as they continuously turn the policymaking crank. The Machine envisioned is an online system to harmonize the interests of civic leaders, vocal and marginalized citizens, and government. Democracy's need for ongoing public consultation would fuel the Machine, which would, in turn, generate focused and empowered deliberation that gives back to government the legitimacy necessary to make tough policy decisions.

To see how the Machine operates, though, requires backing up to consider the central problem it addresses. Once that is clear, this essay will explain how to assemble its parts to generate a workable solution. It bears stressing that the proposed solution represents one of many potentially fruitful approaches. The point here is to move us closer to designing a civic commons that shares the broadest aims and features of the kinds of solutions suggested herein.

The Problem of Public Consultation

Consider for a moment a strange fact: Nobody has produced a reasonably precise estimate of how much money government spends on public consultation and public relations in the United States. We see land use and planning notices posted on fences in our neighborhoods, and we see in the news high-profile public hearings on catastrophes, such as the toxic water supply in Flint, Michigan.

Behind such actions are statutes and principles of government that compel ongoing citizen consultation at every level of government in the US. For instance, the Federal Administrative Procedure Act (1946) requires "notice and comment." Agencies "shall give interested persons an opportunity to participate in . . . rulemaking through submission of written data, views, or arguments." Furthermore, agencies must give "consideration of the relevant matter presented" and justify rules by stating "their basis and purpose."

Most state and local governments have in their founding documents passages such as this one from Article 1 of the California State Constitution: "The people have the right to instruct their representatives, petition government for redress of grievances, and assemble freely to consult for the common good." In the heart of Silicon Valley, the Santa Clara County Mission Statement reads, "We create an inclusive environment that supports the diversity of our community. We take action to communicate openly and frequently, encouraging public participation." Even without a mandate or mission statement, most elected officials really do want and need constituent feedback to enable them to govern effectively.

Given so much regular public consultation, the price tag must be large. A recent Congressional Research Service study found that the federal government spends

roughly a billion dollars each year on public relations and advertising. The US Travel Association estimated that the feds spend nearly 18 billion dollars annually on meetings (including travel, naturally). Consultation accounts for part of those budgets, but it also involves considerable unbudgeted staff time. As a rough approximation, let us assume the magnitude of government spending on consultation is at least one billion dollars. Even that figure represents one-sixth of what public officials and agencies already spend on "civic technology" in all its forms, but a billion dollars is probably within a magnitude of the total spending.

What does that money buy? With public distrust in the US government hovering near its highest point in the history of polling, it appears that citizens doubt the sincerity of public consultation. True enough, a 2010 Knight Foundation study showed that those attending public meetings came away feeling less efficacious and more detached from their community.

Consider what citizens see when they meet with government. The most ubiquitous form of public engagement may be the public hearing format. Even the government officials who organize these know that these meetings have limitations, or worse. Since hearings are often required by law, officials and citizens alike can start a hearing in a legalistic frame of mind. The aim is to fulfill requirements or prepare arguments, rather than deliberate. Most hearings are poorly attended, and officials often see lining up in the speaking queue only familiar faces, who will sing familiar songs.

If, on the other hand, political arsonists fan partisan flames, public meetings become pure theater. Such was the case for the infamous 2009 "town hall meetings" held around the country in advance of the Affordable Care Act. When members of Congress went home to hold these sessions, an angry crowd greeted them with shouts and bitter complaints, including scripted, baseless arguments developed by conservative groups intent on derailing the proposed legislation.

To avoid a raucous scene, Arkansas Senator Blanche Lincoln joined many colleagues in avoiding such meetings altogether. "If people genuinely wanted to have a constructive conversation, then that would be a different thing," she said. "But that has not been what we've seen."

Efforts to solicit input quietly, through a process called e-rulemaking, have yielded mixed results. The best successes in this online consultation have drawn fresh insights

from citizens who would not have made the same contribution through a face-to-face meeting. Soliciting feedback via the Internet, however, also invites mass comment campaigns, which clog up the process and may, if anything, dampen the substantive impact of more thoughtful public input.

The bottom line? The government spends an incredible amount of money, partly out of obligation, to engage the public in a way that often proves counterproductive.

A Public Ready to Engage

The most cynical remedy to this situation involves government simply cutting its losses by paring back consultation and trusting in elections as a sufficient means of public input. However elegant that solution might seem, it ignores the fact that Open Meetings Laws and other statutes mandate consultation. Moreover, pushing the public away will have unintended consequences, such as pushing citizens to draft more ballot measures, which can yield legislation inferior to that which could have been crafted more collaboratively.

More importantly, the impulse to give up on consultation overlooks the public's readiness to engage, when invited to do so *in the right context*. Much ink has been spilled to demonstrate the public's apathy about public policy, or at least its willingness simply to let government govern. There is truth to both claims, but an equally strong pattern of facts shows a public that will engage, thoughtfully and forcefully, when given the right set of incentives and feedback.

Citizens from all walks of life will raise their hands when called on to serve in ways that give them a real voice on consequential questions. This has been shown in real-world deliberative events, both large and small. An experiment published in in the American Political Science Review made the point best when it showed that most people who want to let the experts govern, without further public input, actually "have highly conditional attitudes regarding participation." It turns out that "their frustration with status quo politics is not the same as apathy or dislike of political involvement per se." When invited into a deliberative forum that promises meaningful discussion, including with one's elected representative, even most citizens normally tagged as apathetic or complacent were ready to take part.

Such findings underscore the importance of context. A smart government recognizes the need for a coordinated and carefully designed set of opportunities to maximize the quantity and overall value of public engagement. A few cities have won international recognition for thoughtfully engaging their citizens, such as Recife, Brazil, for its well-built Participatory Budgeting program, which effectively draws disenfranchised citizens into real budget decisions that improve their daily lives. That same process has now caught on in the US, with tens of millions of dollars on the line each year in cities across the country.

In the US, the city of Austin, Texas, has one of the most ambitious programs, headed by a Community Engagement Consultant. The public helped build the program itself, which develops new engagement opportunities in accordance with principles such as accountability, accessibility, fairness, and stewardship. One of the fruits of this effort is the SpeakUpAustin! web portal, through which citizens can learn about upcoming projects, offer input through surveys or comments, and join ongoing discussions. What is most encouraging about this example is the city's aim to integrate various opportunities and keep citizens connected with the city over time.

Building a Better Public Engagement Portal

Austin and many cities like it are taking these ideas in the right direction, but these efforts would become more effective by working through a so-called Democracy Machine, which is described here in detail.

The Democracy Machine would exist as an online portal that links together extant forms of engagement, both online and in-person, to maximize their reach and impact. By interconnecting complementary forms of civic learning, engagement, and influence, the Machine itself would improve the quality of public input, the responsiveness of the rules and laws shaped by it, and the very legitimacy of government.

The fuel that starts up the Democracy Machine's motor is the funding from public officials and agencies who wish to engage the public on a particular issue. The Machine uses that call for consultation to bring forward large numbers of individual citizens, who choose among different forms of engagement. Some might choose to complete lightweight surveys, where they learn about alternative administrative rule

proposals, state individual preferences, and offer commentary. Others might choose intensive opportunities for open-ended discussion or focused policy deliberation.

Through an iterative process, the Machine distills citizen input into precise and well-reasoned recommendations, which go back to the government office that initiated the process. That same office feeds back into the Machine its response to the input and follows up later, in weeks, months, or even years, with assessments of the efficacy of the adopted policy. Through the Machine, the citizens who helped shape the recommendations learn of the government policy choice and its downstream consequences. Ultimately, the Machine asks citizens to assess the government's responsiveness and the wisdom of its judgment. (This process will sometimes hold a mirror to the citizens themselves, should they ultimately deem their own input to have been ill-advised.) Agencies found to be responsive and effective get a discount for the cost of their next consultation. If the government disregards the decisions made by citizens, the Machine provides a verifiable record of public judgment that could be used to hold officials accountable.

Figure 1 summarizes the basic operation of the Machine and shows more clearly its central distinctive feature: a long-term feedback loop. Too often, citizens show up for a meeting, fill out a survey, or send a letter or message through social media, only to get a prompt response of little substance. Even those who participate in a satisfying meeting with public officials rarely learn what ultimately came from it. Citizens do not get the satisfaction of seeing their energy go to good use, and government gets no credit for being responsive. This makes many citizens cynical about the very idea of engagement, and it makes governments resent their public participation mandates. Linking inputs to outputs, and then giving citizens the chance to evaluate those outputs, simultaneously combats cynicism, resentment, and unresponsiveness.

FIGURE 1. A SKETCH OF THE LONG FEEDBACK LOOP IN THE DEMOCRACY MACHINE
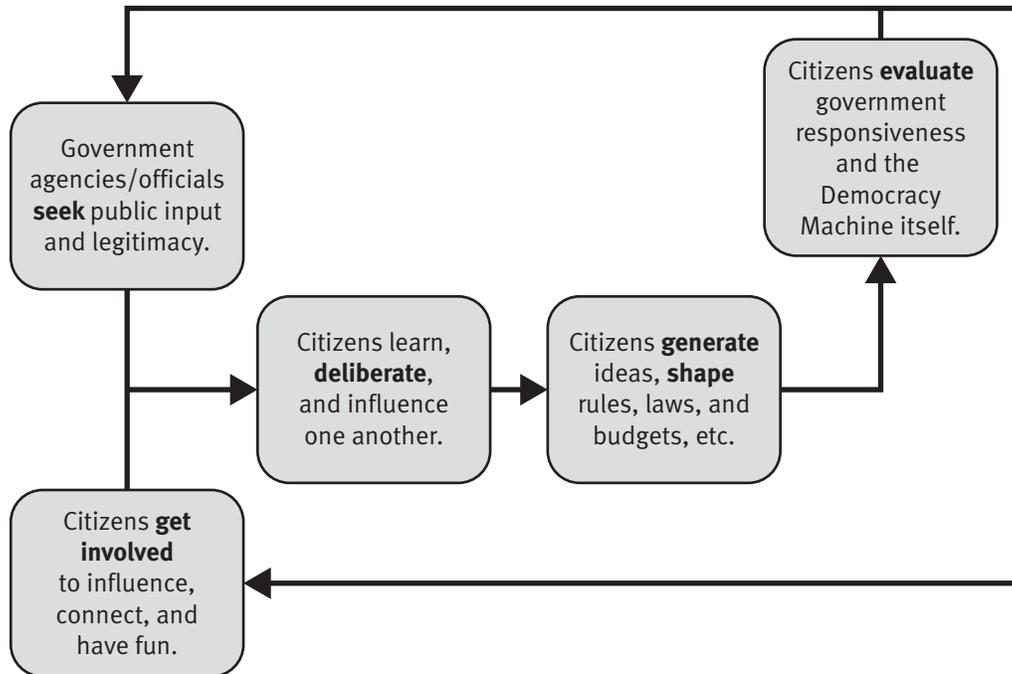
Components of the Democracy Machine Already in Operation

As stated earlier, the Democracy Machine is as much about connecting pre-existing online tools as it is about establishing a civic web portal with novel features. Perhaps the most important component of the Machine is the Common Ground for Action online deliberation space co-created by Conteneo Software and the Kettering Foundation.

Loosely based on the National Issues Forums program, Common Ground for Action is a highly structured online deliberative forum in which four to eight citizens meet for one or two hours to talk through a challenging policy issue. Graphics generated in real time by the users themselves show the shifting shape of a discussion group's common ground. By sharing personal stories and experiences, assessing three to four options rooted in values, and reflecting on the advantages and tradeoffs of a larger list of potential actions, the forums help participants discover where they can agree to move forward. Reviews of past studies have shown that, on particularly polarizing issues such as immigration, breaking down hardened positions requires discussions with these characteristics.

Figure 2 shows an example of one such group identifying the set of health care reform actions they can all live with, after discussion. What is unique about Common Ground for Action is that it can show policymakers not just the aggregated judgment of many individuals but also the granular results of these group interactions. By sharing personal stories, assessing three to four policy choices, and reflecting on the pros and cons of a larger list of potential actions, the forums help participants discover where they can reach agreement.

FIGURE 2. A SCREENSHOT OF THE FINAL STAGE OF A COMMON GROUND FOR ACTION FORUM
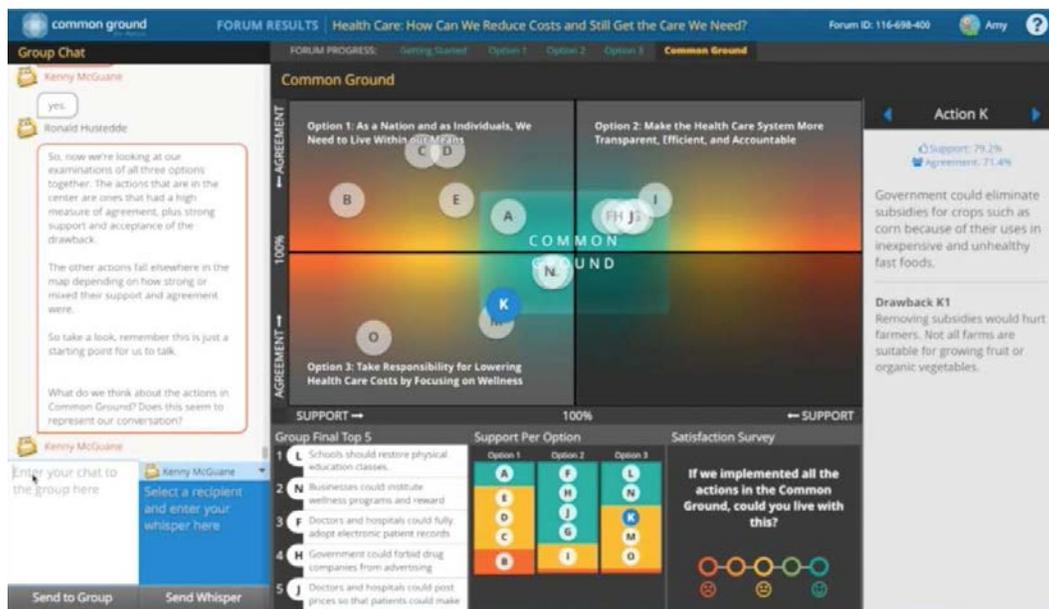
There is no secret to the process, beyond the mundane magic of honest dialogue and focused deliberation. For years, well-structured discussion processes have proven their mettle as a means of generating policy insights from lay citizens. Even randomly selected groups of citizens deliberating in chat-like environments have shown that they can sometimes work as effectively as their face-to-face counterparts. By capturing the details of these discussions, Common Ground for Action generates a rich dataset for analysis. Pooling such data across hundreds or thousands of forums could provide powerful insights to policymakers about where and how to act.

Whereas the Common Ground for Action interface helps participants work through a pre-structured discussion guide, sites like the Madison Project and the Legislation Lab provide examples of platforms wherein citizens can generate legislation itself. Crowdsourcing legislation is not as chaotic as it might sound, and the Legislation Lab has worked on everything from drafting tenancy law in New York City to the Kurdish constitution.

Online tools can meet citizens at an even wider array of entry points to the political process. James Fishkin, who created the Deliberative Polling system used across the globe, has suggested that deliberative events may work well not only for policy consultation and constitutional change, but also as tools for nominating and evaluating candidates and ballot propositions.

Online variations on this idea include the Living Voters Guide, which helps citizens think through the pros and cons of ballot measures in the state of Washington. Funding from the National Science Foundation helped get this project off the ground, and an ongoing partnership with the Seattle Public Library has built a fact-checking function into this guide, lest its users get tangled up in nonsense posted by less conscientious citizens.

Others, such as Public Agenda's Matt Leighninger, have already made roll calls of such processes, but the examples provided here should suffice to illustrate the range of tools already operating online. The trick is to get them to work in concert and in a way that sustains them over time. For every functional online method of civic engagement, 12 have already folded for lack of sustained use and development. A Democracy Machine would promise to not simply link up those components but help their developers increase their usage and keep them in good repair.

Linking the Machine's Components

Part of what makes Google so powerful is its ability to link up searches, retailers, apps, social networks, and personal e-mail, calendars, and more. When one logs into Google and sacrifices a measure of one's privacy, the reward is an online experience that leverages one's past inputs, reactions, and connections. A Democracy Machine can provide a similar integration to leverage what otherwise are decoupled inputs and experiences.

To envision how the Machine functions, think of it as a game. The idea that democracy could be "fun" has captivated civic reformers, such as the Participatory Budgeting Project's Josh Lerner, who gave the concept a book-length treatment. "Serious games" have become a form of business consulting at IBM, and universities and nonprofits creating digital innovations often feature games prominently, as in the case of the Emerson College Engagement Lab.

Anyone who has played app games or massively multiplayer online games knows how compelling it can be to build up a persona in such a game, with opportunities to amass and spend credits, level-up avatars, and make friends with other players who, outside the game, remain complete strangers. Political and civic engagement opportunities could likewise plug into such a gaming system.

Imagine that whenever you took the time to engage in direct action through a civic portal, such as Change.org, you accumulated "credit" for the effort in the Democracy Machine through an automatic background process. Low-effort actions such as these form the lowest level of participation in the Machine, but they play an important role in building up civic competence.

Playing in CNN's political prediction market, for instance, might feel like a form of goofing off—a guilty pleasure no different from managing the roster in a fantasy football league. Political scientist Philip Tetlock, however, makes a convincing argument that playing the prediction market successfully requires developing an open mind and becoming responsive to new information—especially when it disconfirms one's biases.

Likewise, many online games teach players how to listen effectively and broker compromises. Luke Hohman and the folks at Conteneo, Inc. have developed such games used for both civic- and private-sector customers. Impact Games has built one-player scenarios that teach similar lessons, such as its award-winning Peacemaker game that humbles anyone who tries to broker peace in the Middle East, and its Play the News game, which blends news-reading and prediction. Beyond such standouts, the web has accumulated a huge array of games that teach collaborative skills to both kids and adults, who would not even think of such activities in civic terms. The Democracy Machine can couple itself with such experiences to "credit" those who play and win at such games, regardless of the motivation behind their participation.

To pay the bills for sustaining the development of its most valued linked components, the Machine also can offer players the chance to gain credit for completing interactive surveys and participating in online focus groups, as part of consultations by government agencies and other entities.

For the "gold farmers" active within the Democracy Machine, however, the real goldmine lies in the more intensive activities, such as the Common Ground for Action forums. One can earn credit not only for participating in deliberation but also for succeeding at finding common ground when paired with participants from different backgrounds. Even more credit comes to those who receive favorable Uber-like ratings from their fellow travelers, who score another player as having made thoughtful contributions, and appeared responsive to others' ideas.

Credit can flow from many activities and might even start to seem like a kind of civic Bitcoin, except for the fact that the credits cannot be purchased, exchanged, or converted into personal income. Their value lies in how they can be used. Accessing the higher-order functions of the Machine requires spending such credit, like dropping tokens into an arcade game. Machine players require credits, for instance, when they wish to sign a petition to place items on the agenda, to rank the priority of items up for discussion, and to vote on final sets of policy recommendations. As this partial list suggests, the Machine's players will, in time, not only respond to consultation requests from government, but they will also control their own agenda—by either initiating discussions spontaneously or dismissing requests for consultation that they deem irrelevant or unnecessary.

Leveling Up and Forging Bonds in the Machine

For citizens who want to get the most out of the Machine, the most important function of credits is spending them to level up. Figure 3 shows a sketch of nine such levels, from a simple registered user (Level 1) to an expert player eligible to serve on the Machine's national board (Level 9).

FIGURE 3. REQUIREMENTS AND REWARDS FOR ADVANCING LEVELS IN THE DEMOCRACY MACHINE

Level	Requirements	Rewards (unlock activities)
1	Registered user account	Collaboration games and basic surveys
2	Credit threshold	Focus groups and deliberative forums
3	Deliberation and credit threshold	Join an alliance and sign petitions
4	Peer feedback and alliance contribution threshold Voter registration verification	Host deliberative forums Vote on final policy recommendations Complete policy responsiveness surveys
5	Hosting experience, coalition contribution, and credit threshold	Create new alliances, serve as alliance officer, and recruit/boot new members
6	Recruitment and credit threshold Relinquish anonymity	Forge coalitions and prioritize agenda
7	Peer feedback and coalition development threshold Local board review	Initiate petitions to raise new agenda items
8	Nominated by coalition members Monthly credit "dues" required to stay at this level	Public outreach on behalf of Machine Recruit public officials to feed Machine Eligible to serve on local and state boards
9	Randomly selected from among the active Level 8 district members	Eligible to serve on the national board Advise on Machine development

Some of the levels merit more detailed discussion than Figure 3 allows. In particular, notice how the Machine handles the related problems of lurkers, anonymity, and civility. Anyone can become a part of the Machine's regular operation simply by registering as a user, with the option of doing so anonymously. Even the second level simply requires a bit of Machine use to accumulate the necessary credit, such that when Level 3 Machine users join public deliberations, even if they choose to do so anonymously, there will be strong credit incentives to engage in honest and respectful deliberations, lest poor peer feedback leave one stuck at that level. (Engaging in abusive and trolling behavior, such as the harassment that occurred during Gamergate, can result in a canceled account.)

The jump to Level 4, however, requires revealing one's identity to the Machine itself as a registered voter with a specific name and address. The request for Level 4 status involves completing an online form that first confirms the existing player's

identity. For example, the Machine might send a physical postcard through the US mail. The voter receiving the card then has to use a code provided, plus his or her online user's identification information, to verify that user and voter are one in the same. At this point, the player moves up to Level 4 and becomes much more powerful.

For the purpose of generating representative public recommendations for government agencies, the Machine distinguishes between its full population of users and the subset whose identities it has confirmed. This permits an aggregation of judgment that can be weighted using demographic, census, and voter registration data to ensure a representative public voice. If the Machine's participants weighing in on a proposed California law, for instance, over-represent Orange County, the input from that county can be assigned a fractional weight. As explained later, such weightings can be far more subtle by virtue of the Machine comparing its players with what it knows about the larger world.

The next big jump comes when the player is ready for Level 6. At that point, the player must be ready to relinquish anonymity altogether. At and above that level, players begin to shape the higher-order functions of the Machine, such as what goes onto its agenda, how it interfaces with government, and even how the Machine itself should be developed in the future.

At the Machine's inception, its creators will populate and appoint members to the highest levels, so that it can initiate its operations even without any high-level players on its roster. Gradually, though, the development team becomes nothing more than minority partners, who must give way to veteran players. This is, after all, a blueprint for a *democracy* Machine. Thus, internal decision-making processes in the Machine will, themselves, have to ensure a healthy decision-making process, whereby the board and the larger membership, perhaps stratified to reflect corresponding populations, must review and approve together any major changes to the Machine's architecture. This is analogous to the process modern companies use to monitor and improve their offerings based on market feedback.

Figure 3's list of levels also features two important terms—alliances and coalitions. Online games often encourage players to join a group of fellow players, and this immediately transforms what felt like a single-player game into a collective endeavor. Just as certain mythic items might only be won in World of Warcraft through a successful

team "raid" of a castle or dungeon, so can Democracy Machine players only advance by actively contributing first to an alliance (Level 4), then to a coalition (Level 7).

An alliance in the Machine is whatever grouping-of-convenience a player might choose. This might be a group committed to conservative politics or one with an appetite for atheism. It can be based on geography, ideology, fandom, or whatever. It simply has to hold together sufficiently to get its work done, gain credits, and advance its members as far as they care to go. After launching the Machine with a few initial pre-built alliances, future alliances will only be created by players who have themselves experienced a successful alliance membership. An alliance gains credits by increasing its ranks of active members, along with potentially purging its inactive ones. A large but inactive alliance may generate far less credit than a small but committed one.

A higher-order grouping is a coalition, and the greatest credit rewards go to those who can forge coalitions that span diverse alliances and encourage their members to deliberate across those same alliances. The strongest coalitions will answer the call when the Machine declares new Membership Quests. These Quests use the Machine's information about its database of players at or above Level 4 to identify specific groups underrepresented in its existing membership. The Machine will cross-reference voting results by precincts and population data by census blocks to recognize the most egregious gaps in its membership.

Roughly speaking, this permits the Machine to drill down to geopolitical units of approximately 1,000 people to see where it needs new members. For instance, Silicon Valley's Santa Clara County has a registered voter database composed of 44 percent Democrats, 22 percent Republicans, and 30 percent Independent. Extrapolating from the precincts represented in its membership, the Machine can estimate the political makeup of those Level 4 users verified as residing in that county.

For example, if Santa Clara Republicans are the underrepresented group, the Machine can initiate a Membership Quest that rewards coalitions capable of bringing in new users from precincts with high percentages of Republican voters living within them. Demographic targets can work the same way—and even more effectively, in the case of income group underrepresentation.

None of this requires trusting the accuracy of the demographic survey responses of individual users, though in time, it may prove easy enough to cross-validate that

information using publicly accessible big data. Incorporating such information into the Machine could also raise the value of its service for government officials and agencies who wish to consult it. After all, if the Machine can assess the validity of at least aggregate demographic responses in such surveys, it may help ensure the representativeness of the respondents randomly sampled within the corresponding subgroup of Machine users (e.g., voters living in proximity to a proposed land use action).

As the diversity of the Machine's membership grows, and is verified through various means, coalitions also gain credit by forging agreements across those same differences, through online interfaces such as the aforementioned Common Ground for Action. Crowdsourced legislation gains legitimacy by emerging from within—and across—diverse coalitions.

Advanced Feedback Loops

Ultimately, such online networks can become political forces in and of themselves, and the reward for making it to this point in the essay is seeing the greatest power of the Machine, with all of its most complex parts in full operation.

Returning to the feedback loop in Figure 1, the point of citizens evaluating policy responsiveness goes beyond congratulating or chastising a consulting agency. One point of the loop is to strengthen incentives for such an agency to respond thoughtfully, in a way that will resonate not with an apathetic mass public but with a body that has just finished deliberating together on the issue under consideration. The more favorably the Machine's players assess an agency's response, the greater a discount the Machine will offer on future consultations. A virtuous cycle can ensue, whereby each iteration encourages the agency to return the next time it seeks public input, and when it does so, it will return to a group of players who can see the encouraging responsiveness score of the agency. The measure of trust that could grow in such an exchange could finally achieve the legitimacy benefits that public consultation was supposed to yield. This goes beyond existing civic tech, which a recent World Bank report described as creating opportunities for responsiveness without always increasing officials' willingness to act on them.

Now, instead of an agency, imagine that a legislator—or a legislative caucus—chooses to employ the Machine to solicit input on a new law. The Machine could be

asked to help draft a law, choose among competing pieces of draft legislation, or evaluate a particular law that is already in committee. When the Machine's players arrive at a strong policy recommendation, they would have the opportunity not just to watch that proposed law move through the process; they could also advocate on its behalf directly to other legislators. In doing so, the players transform themselves from a networked consultative body into an autonomous political force. The Machine becomes self-aware, more powerful than ever.

Public officials who engage the Machine conscientiously need not even have success with getting any particular law passed. If they build up a strong reputation for responsiveness in the Machine, that may be enough to propel their careers professionally. The Machine might have the power to endorse such candidates, and certainly, its members could choose to work on behalf of such people in more directly political ways.

More importantly, the Machine itself might generate leaders of its own, who step out of the Machine and into the offline political world. This is the intention of some existing platforms, such as Nation Builder, which markets software to nonprofit and political organizations to help them raise money and gather supporters. The Machine could end up serving a similar function indirectly and at no cost to its users. The most highly rated and level-advanced Machine players might well become tomorrow's political leaders or key policy advocates.

Whether such advocacy would lie outside or within the Machine is an interesting question, but the Machine could certainly encourage its players to invest directly into projects. Imagine a participatory budgeting project within the Machine generating a set of desired policies, including some that lie just beyond what the city's resources could afford. If the players believe in the wisdom of their budget, they may be able to use their own labor in addressing some of those off-budget needs, such as reclaiming a park that has grown into a hazardous thicket of weeds and trash. There is no reason that such labor could not be accounted for in the Machine, as a special form of credit, perhaps increased the more diverse the participants who take part in such a cleanup.

Over time, the Machine's income may generate a considerable surplus after covering the cost of the Machine's ongoing development. Logic dictates that such a surplus go into the hands of the Machine's collective membership, which could convert stored up credits into real funds that could be spent on local or even national projects.

Or, perhaps the surplus could serve as a matching fund for every small contribution given by the players, not unlike existing crowdfunding systems, such as Citizinvestor or Neighborly. Taking a more systemic view, the Machine's players might instead choose to use their surplus to promote civic engagement.

One reason for optimism about the wisdom of such allocations is that every successful cycle of the Machine feeds back into the civic capacity of its players. Through everything from playing prediction games to deliberating within diverse player groups to tracking and evaluating government responsiveness, the players cannot help but sharpen their political skills, knowledge, and empathy. One study of the surveys conducted before and after deliberative events has shown that such discussions tend to make participants think in more "cosmopolitan" and "collective" ways, which means that they try to see problems through a wider lens. Participating in multiple iterations of the Machine's policy assessment process would likely cultivate similar values in its players.

Extending the Machine's Reach

Beyond the functions described above, the Machine could grow in ways that have both clear advantages and potential liabilities. This essay began with the idea of public consultation by government because it is a mandatory activity that naturally fits the Machine's purpose, but many other funding opportunities could come from outside of government.

Proponents of future ballot measures might seek guidance from the Machine, either in the form of mundane surveys and focus groups or a full-fledged deliberative process akin to agency consultation. Political parties and interest groups could want access to the Machine for an even wider range of purposes. The challenge becomes maintaining the Machine's political neutrality while resisting the urge to keep it apart from politics entirely. It would be a sad irony if a machine named for democracy kept players at arm's length from the exercise of power during electoral processes.

Other potential funders could muddy the Machine's mission yet still provide intriguing opportunities. Philanthropists who wish to launch challenge grants could challenge the Machine's players to reach common ground on a potential fundraising purpose, with a not-for-profit foundation offering a five-to-one match for the amount of Machine surplus

that players are willing to commit to the cause they choose. Academic researchers could be granted access to the Machine's rich database of text and action, with potential uses of these data being reviewed by the Machine's own board. Perhaps the best proposals for the use of the data would receive discounts, or even free access to the data.

Though conceived in a civic context, the Machine's engine could be licensed for use in large nonprofits and private businesses, which often have the same problems of legitimacy and member commitment that governments face. Visionary businesses whose very products may require a public more concerned about sustainable public policy (e.g., shifting government subsidies away from fossil fuels and toward renewables) may also be interested in helping to develop the Machine itself, and such partnerships could prove invaluable so long as the purpose and development trajectory of the Machine remained in the hands of its players.

Careful readers may have wondered if the Machine requires new users to affirm that they are US citizens at least 18 years of age. The voter registration verification only screens for these features at Level 4 and above, and young people and non-citizens could participate in the Machine's lower level operations simply by posing as US adults at the time of registration.

Participants under the voting age present special problems in terms of data archiving and privacy, and this will have to be handled carefully. Even so, there are reasons to encourage these populations to take part, at least on the lower Machine levels. High school teachers could set up special alliances open only to students in their civics courses. Special coalitions could be built that only permit membership by other high schools or through existing civic educational game platforms, like iCivics. Some participatory budgeting projects have been youth-focused, as the city of Boston has been doing since 2014. Chicago Decoded has a project drawing in youth to envision how their city could improve, and the national initiative on mental health known as "Text, Talk, Act" has pulled in over 38,000 participants into its flash-deliberations, including many young people. There is no reason the Machine could not follow suit, perhaps hosting special events open only to younger users.

Likewise, non-citizens could participate in the Machine and learn civic skills that would serve them well if they became US citizens in the future. Alternatively, those logging in from other countries could get a feel for the Machine's operation and apply

what they have learned to their own nations. There is no reason the Machine could not be replicated in other languages in other countries. With civic engagement now widely recognized as a key to economic development, the World Bank and other influential international organizations are actively seeking ways to increase public participation in governance.

For that matter, an international Machine, with increasingly effective automatic translation, could help bridge citizens ready to engage on issues of global import, whether consulting with the United Nations or transnational nongovernmental organizations. Operating at a global level may prove the only way to enable the world to address a growing number of problems that operate outside of any single country's borders, ranging from refugees to resiliency. If it operated at a global level, the Democracy Machine's online existence would be indispensable for bringing together people separated by oceans and borders.

The Machine, however, should develop in a way that also links to existing face-to-face processes. Many people are already accustomed to "checking in" via apps like FourSquare, and "responsive cities" have a suite of apps, such as Albuquerque's 311 app, that citizens can use to give real-time feedback on potholes and more intangible problems in their communities. The Democracy Machine would connect with these apps and more to give people credit for anything from attending town meetings or reporting for jury service to joining a protest or doing policy advocacy, should the privacy concerns of such information not deter people from doing so.

In return, a well-integrated Machine could give updates to participants that make those experiences more meaningful. Jurors dismissed after being designated as alternates could learn the result of the trial they had watched. Those who took part in a contentious school board meeting could learn what action the board took, weeks later. The point is not simply that the Machine can draw offline events into its credit system. The more powerful idea is that it can draw those events into its feedback loops, which help individuals see (and assess) the long-term impact of their civic activities. The more success the Machine has with this, the more buy-in it will get from the public officials and community leaders who organize such events. Natural partners for such integration are the "civic labs" sprouting up across the US, which operate outside of government but can generate innovative solutions that find their way into policy.

One offline event that bears special mention is voting in regular elections. Alliances and coalitions could have exceptional credit rewards for full, or near-full, participation rates, and they would run spontaneous get-out-the-vote campaigns within their memberships. Such campaigns would likely prove effective, in that they would be well-tailored personal messages among people already socially connected. Electronic voting records, which the Machine would obtain (usually at a small cost from county and state officials), would then verify actual turnout rates in everything from local to national elections.

Evaluating the Machine

As the Democracy Machine adopts new features or refines its basic operation, it will be important to keep in mind its underlying purpose. Loosely inspired by political scientist Robert Dahl's criteria for the democratic process, the Machine's mission is to help tackle five basic problems of self-government:

1. Citizens need to regain control of the "issue agenda," which means that the Machine's original consultation purpose must gradually pair with a more autonomous ability to choose which issues its players will address.

2. Public debate needs to draw in marginalized voices more consistently and effectively, so the Membership Quests the Machine calls periodically must have strong enough incentives to keep drawing in users from underrepresented populations who then become regular players. This is particularly important at Level 4 and above, where voting equality breaks down, in spite of political demographic weighting of results, if the membership becomes too skewed.

3. Government and the public alike need to exercise better judgment, particularly on those most challenging public problems that too often get shortsighted solutions that do little good at considerable expense. Thus, the Machine must prioritize the quality of its internal deliberation, rather than merely growing its membership and exercising power for its own sake.

4. Demanding responsive government decisions couples with that focus on deliberation, because one indirect aim is to spur more thoughtful policymaking

in government itself. If the Machine can take the lead on deliberating, those government officials and agencies who consult it will find it easy to adopt the public's recommendations—and will raise their own estimation of the public's capacity for good judgment.

5. The Machine must give voice to its players whenever possible, including questions about how to frame issues discussed during deliberations and how to develop the Machine itself.

A successful Democracy Machine constitutes its own reward, in that it satisfies the values of democratic self-government it was built to advance. Even so, additional benefits may flow from the Machine's operation. By virtue of leveling-up its membership, the Machine encourages the expansion and diversification of voter registration, and alliance get-out-the-vote campaigns would surely boost voter turnout. It may transform individual citizens into more empowered, reflective, and realistic decision-makers, in some of the same ways that intensive face-to-face deliberation has reduced participants' sense of alienation. The Machine not only builds a bonded social network, it also bridges differences in a way that could strengthen social capital likely to spur stronger civic action.

The Machine could cultivate a culture of co-governance, in which public agencies and officials seek not to steer the public but invite it into genuine collaborations, which bring lay citizens back into the business of government. Ideally, this will build both government and the public's confidence in their ability to work together on the most difficult long-term problems, sometimes referred to as "wicked" ones because they do not lend themselves to straightforward solutions.

Such evaluation is essential because, as with all civic innovations, good intentions could yield unintended consequences. Even with weightings to ensure representative public voice, coalitions seeking to maximize members' credits might "game the machine" by reaching premature and exaggerated consensus. The Machine's users could also become obsessed with short-term policy cycles and lose patience with the long-term feedback loops more suitable to policies that promise only long-term change. Only an ongoing and rigorous evaluation can point out the retooling and rebuilding of the Machine necessary to prevent its gears jamming.

Where to Begin?

At its outset, this essay encouraged readers to think of the Democracy Machine as a metaphor, which shows the need to integrate existing civic technologies to amplify their collective power. If the Machine gets built, it is possible that its users would never think of it as such, in the same way that Google users do not recognize the interconnection of the web services and tools they rely on every day. The Machine is unlikely to have a single software design company overseeing all of its operations, whether that software develops through open-sourced code or other means. It will, however, need to have an application program interface that future developers from the private or public sector can use to add new tools or link up their existing ones. Whether that makes the Machine a singular entity or just a distributed network does not matter so much as the actual achievements of whatever takes on the purpose of the Machine described here.

It makes sense to build a working Machine prototype in a smaller geographic location before scaling up to a state or nation. Likely candidates include cities such as Austin or San José, where there already exists a local commitment to public engagement, a surplus of talent in software development, and a public accustomed to interfacing with their community through online tools. A Machine architect would want to leverage existing relationships among government, nongovernmental organizations, and the local tech sector to build the Machine around the most effective existing civic processes. If the Machine began simultaneously in more than one locale, ideally the two or more teams would work in concert to build a single interface, with localizations akin to those of Craigslist.

Starting locally has the advantage of working on basic challenges in design before facing those that come from a more massive scale. Once successfully built, however, federal clients such as the Environmental Protection Agency will want to access the Machine only if its active user base includes citizens in the particular locales—or on the national scale—where it must address an issue.

For that reason, early development of the Machine may need a boost from targeted recruitments, analogous to those used by market research firms like YouGov, which continuously recruit new survey respondents to maintain a large and representative pool of potential survey respondents. Thus, the Machine's

initial development may need the muscle not only of visionary software developers but also of major foundations.

The first step is bringing together people who share two beliefs: We need a more inclusive and deliberative American politics, and we can harness online civic technology toward that end. The project of democratic self-government is an ongoing struggle, a collective march toward an ideal that can be approached gradually, even if never fully. Given the dramatic advances in digital technology, it is time that we built a Democracy Machine to help advance us forward.

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