TAIWAN: GRASSROOTS DIGITAL DEMOCRACY THAT WORKS

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TABLE OF CONTENTS

INTRODUCTION

Participative, community-built digital tools can be effectively and efficiently used to create more democratic, more open, and more inclusive systems at scale – and one of the best examples of this comes from the island nation of Taiwan. Under the leadership of Audrey Tang, a self-proclaimed civic hacker and 'conservative anarchist', Taiwan has rolled out cutting-edge experiments in digital democracy, decentralized governance, distributed intelligence, and collective hacking, in which more than half of the country's 24 million citizens have participated. This has resulted in the Taiwan's best-in-the-world COVID response, unique participatory data processes, lighting-fast combatting of digital misinformation, and a suite of open-source technical solutions to everything from transportation regulation to climate change.

GEOPOLITICAL CONTEXT

Taiwan is a young democracy that transitioned from military rule following the Cold War. The country has significant economic and political divisions, with the Nationalist elite and higher income groups, as well as social conservatives, among the Han population supporting the pro-unification, socially conservative and often populist Nationalist party (KMT/"right"), and the remaining populations traditionally supporting the pro-Independence Democratic Progressive Party (DPP/"left"). **These divisions burst into social conflict in the mid-2010s with the Occupy-inspired Sunflower Movement that physically occupied the national assembly to protest an opaque trade deal with the mainland that they saw as threatening Chinese surveillance. Since then, heavily using the civic technology we highlight below, these divisions have been significantly repaired, with the current moderate DPP president Tsai-Ing Wen being**

re-elected this year in a landslide.

ORIGIN STORY: DIGITAL DEMOCRACY

'Ask not why nobody is doing this. You are the nobody.' – g0v, hacktivist umbrella organization in Taiwan

In March 2014, the massive, student-led Sunflower Movement in Taiwan occupied the national legislature building of the country for three weeks. In the spirit of their demand for greater transparency and equality in economic relations, the movement itself drew heavily on civic technology developed by the **g0v** collective since 2012 aimed at facilitating transparency, deliberation, and openness. Tang and other hacktivists' **consensus-making platform** proved so successful that the activists gained significant legitimacy in the eyes of the Taiwanese people, and became "reverse mentors" for the members of Taiwan's Nationalist cabinet. With the election of the DPP (Democratic Progressive Party) in 2016, **these tools that began as external networks for civic hacking and digital democratization have since been incorporated into Taiwan's governance structure, with Audrey Tang as the country's first Digital Minister.**

Successes

1. COLLECTIVE DECISION-MAKING

The Problem

Democracy itself needs to be constantly reworked to succeed, with power dynamics overturned and constant iteration, flexibility, and innovation. Taiwan's twin deliberation platforms, **vTaiwan** and **Join**, take this to the next level by applying machine learning in real-time to facilitate consensus and deliberation amongst large groups.

The underlying technology to both systems is called **pol.is**. Pol.is is a digital platform for gathering and analyzing diverse opinions from large groups, and for then producing high-level, actionable, and statistically significant insights that can be plugged into offline processes. **Importantly, this means pol.is platforms are consensus-building platforms, not discussion platforms – the purpose is to illuminate lines of meaningful and widely-shared agreement for future action.**

The Solution

Pol.is, and by extension vTaiwan and Join, are optimized to facilitate meaningful discussion and cut through conflict:

I. **Pol.is manifests a philosophy of AI that emphasizes human cooperation across difference, rather than optimizing click or view-based engagement, which thrives on competition and polarization and often fosters conflict.** Pol.is takes an n-dimensional space, where n is the number of sentiments shared by a group of people, and visu-

alizes the points of agreement and disagreement through a combination of PCA (Principal Component Analysis) and k-means clustering. The visualization (and underlying data) is open, transparent, and updated in real-time. The dimensionality analyses are paired with a facilitation of face-to-face consultation and collaborative discussion (through a range of tools, including Discord, Sli.do, and Hackpad) to encourage the consensus-making process. Functionally, this also makes pol.is a civic education tool – critical in a democracy for active participation and legitimacy.

II. **Pol.is conversations do not allow for replies.** Only three actions can be taken: users can agree with a statement, disagree with a statement, or pen their own statement for others to interact with. This significantly cuts down on the opportunity for hate speech, abuse, and trolling; there is simply no pathway for those behaviors

III. **vTaiwan and Join employ diversity scoring.** Pol.is implementations in Taiwan increase the scores of statements that receive broad support across lines of difference, optimizing for results that cut across clusters.

IV. **Pol.is is designed to overturn existing power strutures and hierarchies.** Instead of the typical, top-down system of deliberation employed even in most democracies, pol.is allows participants themselves to set the agenda of the conversation in real-time, creating the emergent possibility of grassroots expressions of real community needs, rather than fulfilling a technocratic, survey-like mechanism.

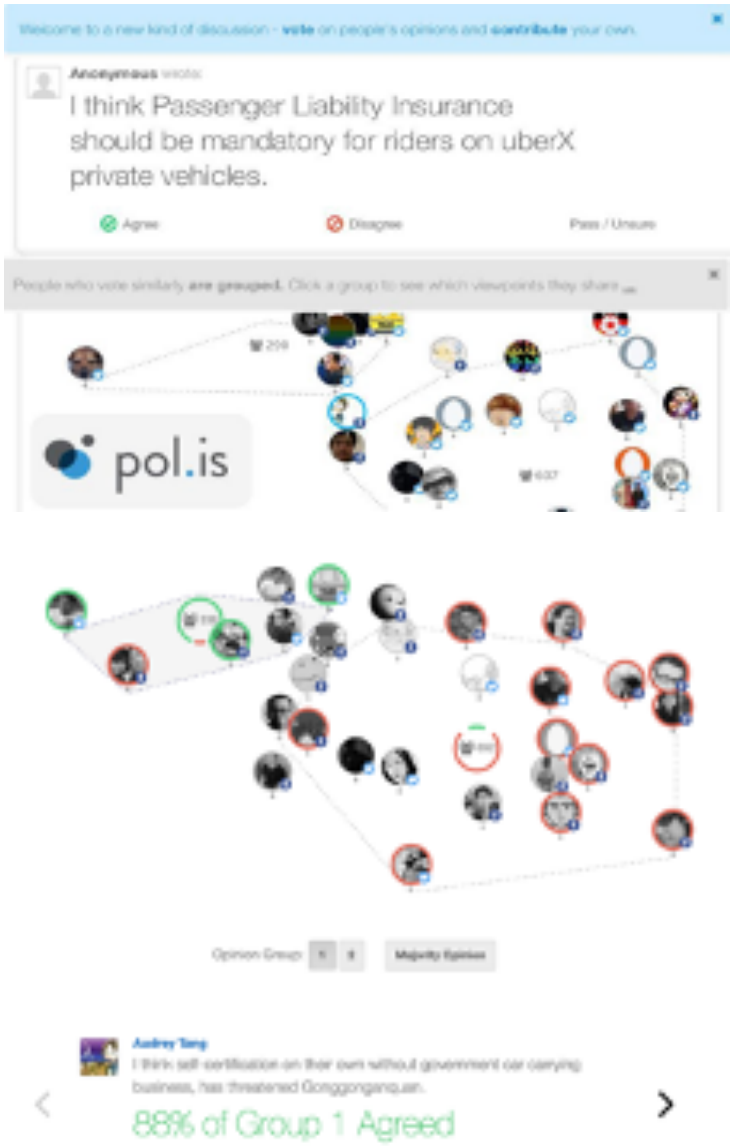

Figure 1: **Results** snapshot of a vTaiwan **conversation** regarding platform regulation within Taiwan's urban centers, focusing on Uber and Lyft

Outcomes

vTaiwan and Join have now facilitated debates on dozens of heated issues, and shaped governance policy both domestically and internationally.

- **Only four years into this experiment, almost half of the country has participated, with 10.5 million active visitors, from a population of 24 million.**

- Complex policy outcomes from this deliberation process have been ratified by the administration, including detailed recommendations around the regulation of technology platforms for the common good (Uber and Airbnb), and proposals allowing for unregulated, small-scale financial tech experiments given transparency thresholds.

- **80% of cases** discussed through the process have led to decisive government action. According to the Brookings Institute, these consensus-based governance mechanisms have transformed **public trust** in Taiwan, addressing head-on the polarization and partisanship that defined the country's politics pre-2016.

2. COMBATTING THE INFODEMIC

The Problem

Deliberation requires a shared foundation of trust and knowledge. Given its geopolitical history, Taiwan is **subject to** some of the most virulent and unrelenting disinformation campaigns in the world, often targeted at disrupting civic and government processes. However, Taiwan is committed to avoiding the potential of state censorship that can accompany centralized information initiatives. **Instead, the country employs a decentralized, human-centered anti-disinformation network, based on a principle of 'radical transparency':**

The Solution

- First, Taiwan's government requires state agencies to correct false claims within their areas of responsibility within two hours. **The rebuttal must come in two different forms – say, a photo and a video – with text under 200 characters.** These rebuttals are actively designed for virality, **using humor** and relevant references to outpace the spread of disinformation.

- Collective fact-checking platforms, like Taiwan FactCheck Center, allow volunteers to come together and systematically track and categorize viral falsehoods, and make appropriate corrections. These platforms have benefited from active partnerships with social media platforms such as Facebook, which marks and grays out posts flagged by the fact-checking organization.

- **Volunteers have also built mechanisms that can process suspicious information. The most popular is called CoFacts, for collaborative facts, which allows users of**

LINE – the most-used messaging app in Taiwan – to submit suspicious links that will then be forwarded to a rapid-response team.

- Digital competence (a step above digital literacy, as noted by Minister Tang), is emphasized in public education across K-12. The curriculum includes school lessons in **identifying misinformation** and building technical systems, and operates through a **co-teaching model**, in which teachers outside of urban areas partner with subject matter experts to teach students digital skills.

Outcomes

Four days before the consequential January 2020 elections, the LINE portal had fact-checked over 30,000 suspicious stories sent by over 140,000 users, and these corrections had been viewed over four million times. Overall, despite a constant barrage of misinformation during two major recent events – first, the January **elections**, and second, the COVID-19 pandemic – Taiwan has remained far more able to keep false and misleading information at bay than most Western countries.

3. DATA COALITIONS

The Problem

In the current data ecosystem, there is a tension between the need for data and the challenge of aggregation:

I. Cutting-edge machine learning and statistical analysis require rich, layered datasets for cross-context insights.

II. However, much of this data stored on personal or organizational devices, or, at a more abstract level, stored as personal or institutional knowledge. Accessing this data is difficult, high latency, and has significant privacy and ownership issues.

Existing surveillance capitalist (or surveillance state) models attempt to resolve this tension by extracting passive data from unaware participants at scale, or engaging in exploitative data labor practices. However, this approach sees the individuals and communities involved as *subjects* rather than as *participants*, leaving the bulk of collective human intelligence and knowledge on the table, while raising red flags around privacy, consent, and data ownership. Further, existing business models encourage organizations to lock down data they can control into siloes, creating monopoly structures and concentrating wealth and power.

The Solution

Taiwan has pioneered a civic infrastructure for data coalitions, that allows for active participation in datasets at scale, while preserving privacy, and allowing public, private, and civil sector use of the resultant datasets, jumpstarting collective innovation. This method has had significant

successes. We outline the foundational case here, regarding citizen participation in a Taiwan-wide climate sensing program:

- **The pollution observation network in Taiwan leverages AirBox sensors – low-cost and simple air quality sensors – as edge devices for data collection, creating a powerful network of data collection and capacity through a proliferation of <$100 devices deployed at scale by thousands of citizens. The number of sensors has grown from seventy to five thousand.**

- The data is open-sourced, and forms a far richer picture of air quality across Taiwan than any of the centralized government sensors or private sensors that had previously been installed in expert-selected locations.

- The project is a collaboration between LASS (an open hardware community), Academia Sinica (a national research institute), private manufacturers (who later produce and sell their versions of AirBox using the coalitions' prototypes), g0v (Taiwan's civic hacker community), and the public sector, especially public schools.

We note that the same infrastructure has been used in the COVID case, below.

Outcomes

- **A few years into the program, the number of sensors in Taiwan has grown from seventy to several thousand.** These sensors are located far closer to areas that require measurement and monitoring, and thus far more cost-effectively provide real-time air quality measures targeted to where people are most active.

- A richer dataset was created for all parties involved by combining the decentralized, coalition data with the National Center for High Speed Computing and a range of private data stores. This dataset was then itself open-sourced, opening the door for further technical development, with citizen groups building analogous water sensors and private industry then adapting water supply to the information provided by these sensors. **The data is now used for prediction and modeling (by the pollution board and by the private sector), for educational purposes, for research, and for international collaboration (for example, Chicago's Array of Things).** The combined model has generated more accurate predictions over extended timescales than any other deployed model in the country. The dataset is free to access and use for all.

4. DIGITAL PUBLIC GOODS AND THE EVOLVING ROLE OF PEOPLE-PUBLIC-PRIVATE PARTNERSHIP

The Problem

Public goods, which can range from access to digital tools to open-source software to public health, require partnership joint investment as table stakes to succeed – but existing models are often less agile, highly neoliberal and technocratic, and ill-suited to technical development. **In Taiwan, existing partnerships are expanded and made more productive by providing digital public goods and infrastructure, enabling the active inclusion of citizen developers and the civic sector, and focusing on the common good – leading to what Tang terms 'people-public-private partnerships'.**

The Solution

- Collective technology development first requires a knowledge of digital spaces and underlying digital competence. To this end, Taiwan prioritizes the provision of digital public goods, extending from 'broadband as a human right', which was adopted by the government in 2017, to country-wide rollouts of digital literacy and digital competence programs. These programs succeed through a combination of private sector donations and execution, public sector program management and implementation, and civil sector education initiatives and cultural drive.

- **During Covid, these partnerships allowed for agile and need-driven technology development at scale.** These solutions combined 1) government data and APIs to access mask availability, 2) civil society-driven app development, ex. building maps and visuals that were easily accessible to citizens, and 3) private sector-donated computation

resources and server space, as well as private pharmacies and stores donating resource availability data to the platform. The collaborative data store was built on the same backend infrastructure as the climate sensors, above.

- The project is a collaboration between LASS (an open hardware community), Academia Sinica (a national research institute), private manufacturers (who later produce and sell their versions of AirBox using the coalitions' prototypes), g0v (Taiwan's civic hacker community), and the public sector, especially public schools.

Outcomes

Taiwan's innovation is built off both basic access and imparted knowledge: 87% of Taiwanese citizens over the age of 12 are connected to the internet. While not a 1-1 comparison given the country size and density, analogous numbers in the US are 70-75% of adults, and 55% of adults with incomes under $30,000, with internet access (often at far lower speeds). Digital competence is taught in class from primary school, covering everything from basic coding to the importance of media literacy and fact-checking.

These systems delivered when stress-tested during COVID: **despite the proximity of the island to mainland China, and the significant amount of travel between the two nations, Taiwan, with a population of almost 24 million, has had a total of less than 600 COVID cases, and only seven deaths, the lowest per-capita rates in the world.** In addition, due to its stellar response and avoidance of lockdown measures, Taiwan has emerged from the epidemic as one of the world's fastest-growing economies, with the least amount of human, economic suffering due to the pandemic.

Conclusion

Taiwan shows us the incredible potential of deeply democratic digital systems that involve, support, and build on constituents and community members', rather than work around them through opaque systems or hierarchical structures.

These successes have resulted from an ecosystem of support and participation – not simply the deployment of technology but a deep understanding of the surrounding sociotechnical and economic systems. Policies like universal healthcare and universal broadband access provide the foundation for Taiwan's public health and digital competence successes. Political will from both parties has allowed for participative innovations to flourish at the center of Taiwan's democracy, rather than on the sidelines. The tireless work of civic activists from the g0v movement has been instrumental in building the technical tools and surrounding trusted social processes for deliberation, data sharing, consensus-building, and grassroots action that have set the stage for the entire ecosystem to flourish.
As we chart a course through this period of disruption and realignment, across lines of democracy, economy, and capital, Taiwan's example charts a path towards a pluralistic, materially shared, cooperative, and solidarity-based digital future. In the words of Audrey Tang:

When we see "internet of things", let's make it an internet of beings.
When we see "virtual reality," let's make it a shared reality.
When we see "machine learning," let's make it collaborative learning.
When we see "user experience," let's make it about the human experience.
When we hear "the singularity is near," let us remember: the Plurality is here.