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How Taiwan's Unlikely Digital Minister Hacked the Pandemic

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30-38 minutes

In early February, Taiwan had a mask supply problem. Howard Wu, a 35-year-old software engineer, watched as Covid-19-induced stress levels rose in his social media feeds. Friends and family were swamping LINE, Taiwan's most popular messaging app, with up-to-the-minute reports saying which local convenience stores still had masks in stock—or were completely out.

So Wu started hacking. In the space of a single morning, he put together a website using Google Maps to coordinate the crowdsourced info pouring in from the messaging app. Anyone could contribute. Convenience stores stocking masks showed up in green. Out-of-stock stores turned red.

At the time, the World Health Organization was still a month away from declaring a global pandemic. But as soon as the first reports of trouble in Wuhan began trickling out on social media in late December, Taiwan had started organizing one of the world's most successful mobilizations against Covid-19. By February, with dozens of deaths being reported in Wuhan every day, Taiwan was on high alert. The mask map was an instant hit.

But there was a catch. When a developer integrates Google Maps into a web application, Google charges a few dollars for every 1,000 times the map is accessed by users. On the afternoon of the first day after the web site went live, Wu received a bill for $2,000. The next day, the total jumped to $26,000. "Continuing in that direction was not acceptable," Wu wrote in a document he posted to HackMD, a publicly hosted collaboration tool popular with Taiwan's "civic tech" sector—a loosely organized community of hackers and computer-literate citizens dedicated to civic engagement.

Enter Audrey Tang, the Taiwan government's digital minister.

Tang was one of the thousands of Taiwanese who had pounced on Wu's map. In a Skype interview from Taipei, she laughs as she recalls the moment. "I contributed to his bill!" Tang says. But then she went to work.

Tang is a fervent believer in open data, open governance, and civil society-government collaboration. Wu's mask app offered a path to putting her principles into action.

The day after the mask map went viral, Tang met with Taiwan's premier to discuss ways to improve the country's mask-rationing system. She suggested that the government distribute masks through pharmacies affiliated with Taiwan's National Health Insurance system, Taiwan's government-run single-payer health insurer. As Tang explained it, the key advantage of doling out masks via the pharmacies was that NHI maintains a database of all the products that pharmacies keep in stock, updated in real time. Tang proposed that NHI make the mask data open to the general public. Instead of relying on ad hoc crowdfunded reports, Taiwan's citizens would gain easy access to more accurate and comprehensive data.

The proposal was greenlit. After receiving approval, she posted the news of the new tracking system to a Slack channel frequented by Taiwan's civic tech hackers. She invited them to take the data and play with it as they pleased. At the same time, while holding her regular open-to-anyone visiting hours, she whipped together her own website to serve as a central clearinghouse for an ensuing profusion of mask availability apps. (Google also helped out by waiving Maps charges in the interest of fighting Covid-19.)

Although Tang is an accomplished software programmer with a long record of significant contributions to international open-source software projects, she was quick to minimize the extent of her technical contributions to the mask app project. For Tang, the significance of the mask map portal was its function as a space for *others* to participate in. She hearkened back to first principles: The portal was an example of her "Daoist approach" to political and social action.

She pulls chapter 11 of the Dao De Jing, a 2,500-year-old classic of Daoist philosophy, up on her monitor, and starts reading:

"*Hollowed out,*

clay makes a pot.

Where the pot's not

is where it's useful.

… So the profit in what is

is in the use of what isn't."

"All I did was to hollow out the clay to make a pot," Tang says. "I didn't do anything afterwards."

One of the fun things about Tang is that no one who knows her is at all surprised when Daoist philosophy pops up in a discussion of governmental Covid-19 containment strategies. It's like her habit of closing presentations by quoting from the songwriter Leonard Cohen ("There's a crack in everything, and that's how the light gets in"). She is simultaneously whimsical and serious, a butterfly who doesn't shy away from heavy lifting.

It's safe to say that most governments are not staffed by officials who share much in common with Tang, a trans woman, open-source software hacker, startup entrepreneur, and the youngest (at 35, in 2016) person ever to be appointed a cabinet member in Taiwan. But when the topic is the successful integration of civil society, technological progress, and democratic governance, it's also safe to say that most countries don't share all that much in common with Taiwan, either. At least not yet.

Taiwan and Audrey Tang occupy a unique spot in a world, where the ascendance of the internet and digital technology is marked by the twin dystopias of "post-truth" information chaos in the United States and China's totalitarian, technologically mediated surveillance-and-censorship regime. With Audrey Tang as the symbolic figurehead, the island nation is making the radical argument that digital tools can be effectively used to build stronger, more open, more accountable democracies. Whether the challenge is fighting disinformation campaigns orchestrated by hostile powers or the existential threat of a virus run amok or simply figuring out how to regulate Uber, Taiwan is demonstrating the best ways technology can be used to marry the energy and talents of civil society with the administrative powers of government bureaucracy.

"In these times of dark uses of technology and disillusionment with technology," says Nick Monaco, an expert in online disinformation at the Institute for the Future think tank in Palo Alto, California, "Taiwan is a good objective reminder that these tools can be put to service for humanity and government."

"Audrey Tang," he adds, "is obviously inspiring."

The question is: Can Taiwan's model be duplicated elsewhere? Or is it specific to Taiwan's unique history and culture?

Tang is simultaneously whimsical and serious; a butterfly who doesn't shy away from heavy lifting.

Photograph: John Yuyi

Tang was born in 1981 with a congenital heart defect, and doctors said it was imperative for her to keep her temper and emotions under control. One of her earliest memories, she says, is of practicing Daoist meditation and breathing techniques designed to maintain a steady heartbeat.

The lessons stuck. Along with ubiquitous paeans to her intelligence, one of the most common things you hear from people when they are asked to share their impressions of Tang are tributes to her preternaturally unruffled nature. It is simply impossible to imagine Tang engaged in a flame war.

But life at public school in Taiwan in the 1980s wasn't all that nurturing for a shy and retiring child who was battling health issues. She acknowledges being regularly bullied and teased, and stories of her rocky passage through elementary school are a staple of Taiwanese newspaper accounts of Tang's life. With the permission of her parents, she ended up dropping out of junior high school at 14 to pursue her own self-directed, internet-aided course of study.

A voracious reader, she likes to joke that her relatively optimistic view of life was influenced by her early exposure to out-of-copyright classics uploaded to the Gutenberg Archive. Everything published after World War I, she says, was still under copyright and unavailable, so she avoided being indoctrinated by accounts of the bleak disasters of the early and mid-20th century.

Regularly referred to by the Taiwan press as a child prodigy with a reputed 180 IQ, Tang says she started learning how to program when she was 8 years old. By 12 she was coding in Perl, an all-purpose programming language that was the tool of choice for many architects of internet-related services in the late 1990s and early 2000s. At 15, she started her own company, serving as chief technical officer for a team of 10 Perl hackers who carried out contract software development in Taiwan. She subsequently became a significant contributor to the international Perl community.

“Audrey is intensely intelligent,” wrote Allison Randal, a former director of the Perl Foundation and past president of the Open Source Initiative, via an email to WIRED, “and passionate about solving problems, but not in the obnoxious ‘top dog’ way that our industry seems to admire so much. (Elon Musk, for example.) I was always deeply impressed with how unfailingly nice she was, even in the middle of difficult conversations. She inspires people to strive to become better—not just doing better work, but also building strong, healthy communities who actively support each other.”

In 2005 Tang began transitioning to female. In interviews, Tang has noted that changing her gender identity gave her a valuable “experience of vulnerability,” but she tends not to focus on whether there was any blowback from general society due to her transition. On the contrary, Taiwan’s popular press seems to treat her trans identity as a point of pride, much like it does the country’s legalization of same-sex marriages in 2019 (the first such legislation in Asia.)

In 2014 she retired from the business world and began focusing primarily on civic engagement. An opportunity to play a key role arrived almost immediately. In spring of that year, Tang provided technical support to protesters who stunned the nation by occupying several government buildings for nearly a month. Originally sparked by outrage at the incumbent Nationalist Party—also known as the Kuomintang or KMT—administration’s attempt to fast-track a trade bill with China, the Sunflower Movement demonstrations turned out to be a landmark event in Taiwan’s politics, eventually paving the way to the election of the Democratic Progressive Party government led by Tsai Ing-wen in 2016.

But even before Tsai’s victory, in a clear nod to the growing influence of Taiwan’s emerging civic tech sector, the KMT’s digital minister, Jaclyn Tsai, asked Tang to help orchestrate a community approach to figuring out how to regulate Uber. This led to the creation of vTaiwan, a method of tapping what Tang calls the “collective intelligence” of civil society with open-source software tools for the purpose of building popular consensus on how the government should approach controversial topics. In the case of Uber, the vTaiwan consultative process resulted in the formulation of a set of proposals that were then codified in law by Taiwan’s legislature. (Uber initially found the regulations too onerous and abandoned the Taiwan market, but it later returned.)

In 2016 the incoming Democratic People’s Party administration appointed Tang digital minister. As the youngest-ever Cabinet member, she became the embodiment of a weaned-on-the-internet Taiwanese generation just starting to get real traction in politics.

For those of us who lived through the internet’s emergence as a major cultural force in the 1990s, the experience of watching Tang give TED talks or explaining digital democracy to audiences, or simply listening to her in person, is like traveling back in time to a halcyon era where the very word “internet” conveyed utopian promises of liberation.

This is especially true when Tang talks about the free and open-source software movement. In the late ’90s, the argument that sharing code freely on the internet was not only a more efficient way to create software but also a template for a progressive reorganization of society writ large, packed an intoxicating punch for idealistic nerds. The rhetoric soared: Open-source democracy would usher in a new era of progressive politics. The geek rapture was at hand.

From the vantage point of 2020, the validity of the open-source software development model as an efficient method for writing code has been well established. As for upending dictators and spreading nirvana? Today’s conventional wisdom suggests otherwise—perhaps the opposite. Authoritarianism is proliferating across the globe while disinformation reigns supreme. The conclusion is difficult to avoid: The internet has failed to deliver on its early promises.

Except, possibly, in Taiwan, where hackers like Tang are not only reprising the rhetoric of the 1990s but doing their best to make that rhetoric hard-coded reality.

In the wake of Taiwan's extraordinarily successful containment of Covid-19 (as of this writing, 455 confirmed cases and only seven deaths), Taiwan's international profile has soared. Suddenly, everyone is curious: What's Taiwan's secret? How can we duplicate its success?

The differences between a country like the United States and Taiwan are so vast as to make any comparison tricky, if not hopelessly quixotic. But there are clear themes that emerge from a close look at Audrey Tang's approach. Promoting openness and transparency nurtures mutual trust—and when the people and the government trust each other, new possibilities for collective action blossom. So the question becomes: How can digital tools be deployed to engender trust?

Taiwan's success at dealing with Covid-19 has many roots. But the existence of the kind of trust necessary to allow something like the mask map portal to exist goes back, Tang believes, to the Sunflower Movement. In her view, the successful occupation of Taiwan's legislature was a crucial moment in the emergence of a new relationship between the government and people.

"After 22 days of 'occupy' in the parliament, there is nobody dead, no one missing," Tang says. "It's all very civil. Anyone who participated in that changed from within, so that they are much more willing to trust that a bunch of strangers in a well-facilitated place can produce something like a rough consensus out of differing positions. We took that and then designed the administration to fit the new political mandate, the new societal norm, the new societal expectations. In a sense, we're just channels of that post-occupy energy."

The mask app, she argues, is a technical project playing to the strength of Taiwan's evolving societal norms. The government trusted the people not to abuse access to NHI data, and the people responded to that trust by creating a multitude of applications that went far beyond Howard Wu's initial experiment, doing things such as adding inclusivity-expanding features like audio assistance for the visually impaired. "If that kind of participatory mechanism design eventually becomes the norm," Tang says, "then you will see a sea change, and people will start to think about how to collaborate with different people, rather than to cast them as others."

Fairly straightforward design changes, she says, can play a crucial role in that process—things as simple as removing reply buttons from interface designs so users don't have easy opportunities for ad hominem trolling, or as complicated as the four-week-long vTaiwan process to regulate Uber. It's fair to question whether such strategies could easily apply to a society as polarized as today's United States. Because at least one thing seems clear—to have any chance making civic technology practices work, you need a critical mass of citizens who are willing and able to participate.

> The "internet and democracy evolved together, spread together, and integrated with each other," Tang wrote in a 2016 manifesto.
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> Photograph: John Yuyi

Mei-chun Lee is an anthropology student at UC Davis writing her dissertation on Taiwan's hacker communities. She is also a veteran of Taiwan's g0v community (pronounced Gov-Zero), the closest thing Taiwan's civic tech sector has to an organizing structure.

From the earliest days of internet penetration in Taiwan, Lee says, Taiwan has boasted a vibrant community of open-source programmers who wanted to engage in social issues. One of the outstanding characteristics of the group, she says, is that "civic hackers in Taiwan are very willing to get their hands dirty. In Taiwan it's a cool thing, both to collaborate with government or resist the government."

The g0v community is the purest distillation of the intersection of open-source values, democracy, and the internet in Taiwan. Founded in 2012 by a group of programmers dissatisfied with the transparency of the Taiwanese government then in power, g0v describes itself as a decentralized community "that aims to use technology for the public good, allowing citizens easy access to vital information and power to shape civil society."

In the years following the Sunflower Movement, g0v members have dedicated themselves to making government processes more visible to the general public. g0v's most high-profile hack is a network of web sites that shadows the government's online infrastructure. Budget.g0v.tw, for example, is an independent version of the Taiwanese government's official budget ministry website.

Another example of civic tech activism spun off from g0v is Co-Facts, a volunteer association of fact-checkers. Co-Facts is built around a chat bot for the LINE messaging app that responds instantly when

users forward potential disinformation that has already been logged and checked. Taiwan is reputedly subject to more disinformation from foreign governments than any other country in the world, in large part because of its decades-long deadlock with China, which refuses to recognize Taiwan as an independent nation. Co-Facts is a Taiwanese civic tech sector immune-system response to the unrelenting disinformation assault.

vTaiwan was Audrey Tang's first stab at designing a participation space that would connect Taiwan's online generation with the nuts and bolts of government policymaking. vTaiwan, to date, has no constitutionally binding authority over government legislation, but since its creation it has been deployed dozens of times to understand and elicit public opinion on issues including the regulation of Uber, online alcohol sales, and the creation of what Tang calls a "FinTech sandbox"—a scheme that allows companies to experiment with financial products that are not technically legally under current regulations for a limited period of time.

A similar initiative, called Join, which is fully government-run and also overseen by Tang, includes in its ambit every aspect of government action and has registered 10.5 million unique visitors. In a nation of 23 million, that's pretty decent click-through.

Both Join and vTaiwan are built on top of Pol.is, an open-source software program best described as a mechanism for developing consensus on disputed issues. "Pol.is," says cofounder Colin Megill, "is a tool for turning crowds into coherence."

Megill's operating theory is that party politics in Western democracies is predicated on the exploitation of "wedge issues" to divide the electorate. Megill believes that "new computational methods" can be deployed to find areas of consensus, rather than division. Po.lis, he says, "gives agenda-setting power back to the public itself."

Pol.is is intended to be an antidote to the polarization nurtured by traditional internet discourse. If Tang is a person one can't imagine being in a flame war, then Pol.is is a program purposely built to prevent flame wars. "There's a lot of very intentional design that makes sure that people can only add to, but not subtract or detract from the conversation," Tang says.

Her favorite example: There are no reply buttons in Pol.is. All you can do is agree or disagree with a statement about a given topic (say, should Uber be allowed to undercut established taxi companies on price?).

Reply buttons, Tang says, are an invitation to trolls to wreak havoc by spreading disinformation, engaging in invective, or creating distraction. If the interface restricts engagement to merely expressing approval or disapproval, the trolls lose interest, Tang says.

In Pol.is, success is defined by the achievement of clusters of agreement. The goal, Tang says, is not unanimity, but rather a concept borrowed from the open-source software developer community: "rough consensus."

"Rough consensus is not that strong," Tang says. "It's just something programmers can live with, then go back and write some running code, and stop debating. That kind of rough consensus is the key in Taiwanese norm shaping, because it enables people to not squander their time on getting the fine consensus out but rather to agree on something that we can all live with. That is something that politics can learn from internet governance: If we can all live with it, maybe that's good enough. Maybe we don't need everybody to be literally on the same side."

Megill says Tang and CL Kao, a cofounder of g0v and former business collaborator with Tang, convinced him to open source Pol.is. Taiwan, he says, has polished the software to its "most complete example."

"Without someone who wants to bring deliberative practices into government," Pol.is is just a hammer, Megill says. "Audrey is the carpenter."

But she's far from the only assiduous tool user in Taiwan. "In terms of citizen-led, civil society engagement with technology for enhancing the democratic good," says ITFT's Monaco, "Taiwan is the most lively civic tech sector on earth."

But how exactly did that happen?

> The idea of a "rough consensus" is something politics can learn from programmers, Tang says. "It enables people to not squander their time on getting the fine consensus out but rather to agree on something that we can all live with."

Photograph: John Yuyi

Audrey Tang has a theory that several accidents of history resulted in a happy marriage of computer technology and democracy in Taiwan.

The end of martial law in Taiwan in 1987, she says, happened to roughly coincide with the rapid spread of myriad clones of the IBM personal computer, and the subsequent acceleration of Taiwan's ascent into a dominant position as one of the world's most important computer hardware manufacturing powerhouses.

Similarly, the first freely contested presidential election, in 1996 (the same year Tang dropped out of junior high school), coincided with the internet's emergence as a mainstream phenomenon. In "On Utopia for Public Action," a manifesto Tang published on the day of Tsai Ing-wen's 2016 inauguration, Tang wrote that the reason "there are so many civic hackers in Taiwan volunteering to work on democracy" is that in Taiwan the "internet and democracy evolved together, spread together, and integrated with each other."

"Instead of a bunch of geeks in IT doing digital things and another bunch of people studying public administration and politics doing democracy, in Taiwan, it's literally the same generation," she says. "For us, there was no democracy before the internet. The democracy comes with the internet."

And then Tang takes the congruence one step further. In Taiwan, she says, "democracy itself is a technology" constantly subject to experimental iteration and incremental improvement. "From 1991 to 2005," Tang says, "the constitution went through seven amendments. "This imprinted on our generation that even the constitution itself is a social technology. Much as you can try different semiconductor designs, you can try different constitutional designs."

According to Eryk Waligora, a graduate student specializing in International Studies at the University of Washington with a focus on Taiwan, the pace of legislative change in Taiwan has only accelerated under Tsai Ing-wen. Since 2016, he says, 20 new acts or amendments related to "cyber and information technology" issues have moved through the legislature.

The sense that anything is possible motivates experimentation and activism. But an equally important propelling force is the fear incited by what Mei-Chun Lee calls Taiwan's "very ambitious neighbor."

For Audrey Tang and Mei-chun Lee's generation, China's growing hostility to Taiwan's de facto independence is both a clear goad to action and a constant reminder of how technology should *not* be used. "Many of our political debates are hinged on not being the PRC," Tang says. "For example, whenever we want to talk about counter-disinformation, anything around censorship is a nonstarter."

"We cannot entertain the PRC's approach to their harmonization efforts," Tang says. "The more they develop, the more drawbacks that we see from our lens of human rights and democracy. We're like, 'OK, we should totally not go there.'"

Tensions between China and Taiwan have persisted since the Nationalist KMT government led by Chiang Kai-shek lost the Chinese Civil War to the Communists and retreated to Taiwan in the 1940s. For decades both Taiwan's KMT and China's CCP considered themselves the lawful ruler of both states.

But a crucial change in how Taiwan sees itself has evolved over recent decades, according to Kharis Templeman, a political scientist at Stanford who studies Taiwanese politics. "Anybody who came of age since about 1996 was educated under a Taiwan-centric educational curriculum that taught them Taiwan is actually a distinct thing and not part of China," he says. "There are a lot of young people who view the threat that emanates from the PRC now as something that they should spend their lives to combat, to push against."

The Sunflower Movement, in fact, was triggered by the KMT government's attempt to jam through legislation expanding trade with China without observing the appropriate parliamentary procedures. The KMT's actions triggered popular fears about economic integration with the PRC and a deep anger at the violation of democratic procedures. "I think the benefit that comes out of having such a clearly defined and undeniable foe across the straits is that it really motivates aspects of democratic activism across the board," Waligora says. "At the end of the day it's easier for government, the private sector, and civil society to align on core principles."

The Chinese Communist Party's unilateral imposition in June of a new National Security Law in Hong Kong, designed to crack down on antigovernment protests, has only served to heighten the contrast between Taiwan and China on issues related to free speech and democracy.

Stanford's Templeman cautions against reading too much into the rhetoric of digital democracy in Taiwan. While acknowledging that there is "a lot of Silicon Valley DNA" in Taiwan due to decades of Taiwanese involvement in computing-related industries, he interprets Tang's appointment as digital minister as mostly a symbolic signal to civil society that the government was aligned with the values of the Sunflower Movement protesters—a signal of solidarity with the civil tech sector, in other words, rather than an actual commitment to radically remake government.

"Tang is a very prominent face of the administration," Templeman says. "In a way though, she's almost a trailing indicator, rather than a leading indicator. She wouldn't be in that position if this administration was not already fairly open to engaging with civil society."

In that sense, she could be seen as little more than a figurehead, a characterization that is perhaps underscored by her unwillingness to act like a traditional leader. On occasions, says Mei-chun Lee, Tang's explicit refusal to be more forceful has disappointed members of the g0v community.

Tang's encouragement of "more participatory ways to invite citizens to be involved in discussions is very good," Lee says, "but on the other hand people *want* her to give commands." Tang's critics, Lee says, believe she hasn't done enough to really open the nitty-gritty processes of government to public scrutiny. They'd rather she give commands than be a conduit.

Yet even in the context of their occasional dissatisfaction with Tang's approach to government and their wariness about the privacy implications of some of the government's technologically aided approaches to containing Cov-19, "g0v participants," Lee says, "are willing to work with Tsai's government because Tsai represents values of openness."

Which, once again, brings the conversation about Tang and Taiwan back to trust.

In his field research in Taiwan, Waligora asked all his interview subjects what they thought were "the greatest threats to Taiwanese democracy." China, of course, ranked first. But of nearly equal importance was the issue of trust—in particular the kind of trust between society and government that is eroded by "digital disinformation."

Tang's efforts to "support a larger digital literacy of civic engagement," Waligora says, address exactly those insecurities. Both as a software programmer and as a government official, Tang has consistently focused on building structures that allow for the sharing of ideas and points of view. To give a unilateral command makes no sense in that context.

For Tang, facilitation is the essence of leadership. Which means that Tang herself is another Daoist "hollow pot" waiting to be filled with meaning. Her significance as a symbol for her generation or for the idea of digital democracy or for the notion of "rough consensus" is as a receptacle in which Taiwan's hackers can place their trust.

It is at this point that an observer from the United States looking for solutions to dysfunctional government may start to despair. The proposition that the Taiwan model is based on nurturing mutual trust between different parts of society is discouraging to veterans of decades of intensifying polarization in US politics. The notion that a software program, no matter how sophisticated, is capable of addressing the culture wars in 2020 America seems ludicrous.

What possible utility could a nifty mask location app provide in a country where the very question of whether one should wear a mask at all can be shaped by political self-identity? And if one of Taiwan's great strengths is that there is an emerging Taiwanese identity that cherishes democracy, how can that indigenous ethos be uprooted and transferred to another pot?

At the end of a 90-minute interview with Tang, I expressed my doubts as to whether her approach could work in a society where mutual trust seemed fundamentally broken. Was there any way to fix it?

It was, I knew, an impossible question to answer. But it's also a question that Audrey Tang gets asked all the time. And she was ready.

"My main suggestion is to start small and to not prescribe anything. Don't make long speeches. Instead, just start designing spaces for people to participate."

And then she started quoting again from the Dao De Jing.

Nature doesn't make long speeches.

A whirlwind doesn't last all morning.

A cloudburst doesn't last all day.

Who makes the wind and rain?

Heaven and earth do.

If heaven and earth don't go on and on,

certainly people don't need to.

The people who work with Tao

are Tao people,

they belong to the Way.

People who work with power

belong to power.

People who work with loss

belong to what's lost.

Give yourself to the Way

and you'll be at home on the Way.

Give yourself to power

and you'll be at home in power.

Give yourself to loss

and when you're lost you'll be at home.

To give no trust

is to get no trust.

How can the rest of the world imitate Taiwan? Maybe the answer is as simple as this: *Be more like Audrey.*
