GOVTECH DECODED
EPISODE 4
SCALING WITH TECH STACK

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(Intro music)

[Alicia] Hi everyone, and welcome to GovTech Decoded, where we decode technical speak. In this series, we will discuss hot tech topics and how the Singapore government leverages technologies to build tech for public good. I'm GovTechie Alicia.

[Michael] And I'm GovTechie Michael, and we are your hosts for today's episode. Today, we'll dive a little bit deeper into how we use our SG Tech Stack to scale our products.

[Alicia] And of course, we have Charis and Liyana here with us again. Welcome back! If you missed the earlier episode, Charis is a lead UX designer, and Liyana is a lead product manager in GovTech.

So actually, I have a question. Why do developers use the SG Tech Stack instead of other commercial solutions out there?

[Liyana] So today, I think you guys know many government apps and services are already developed using the SG Tech Stack. So some examples are CPF web portal, Singpass, MOE school cockpit, and many more. I think a major benefit that we have, that you don't get when you use commercial tools, is that we are really trying to enable inner sourcing and golden paths within the SG Tech Stack.

Quiz question what's open source?

[Michael] You have other developers who share code that can be used by other developers to develop them.

Yeah, exactly. So what we're trying to do is that we're trying to do open source, inner, so within the organisation. So we are trying to make it such that what we can do is that as an SG Tech Stack team, we can develop code, templates, as well as images that can be reused by other developers within the government space. This also means that we are also encouraging other developers to also contribute back towards what we're calling inner sourcing.

It's actually a common concept in the private sector as well. We're actually enabling more reusability. We're actually helping people to shorten the effort required for them so they don't have to start from scratch.

[Charis] So curious as a designer, right? Does this mean that in the future all the apps will have the same look and feel? Are they using the same design elements? Is that something that...

[Liyana] Yeah, I'm glad you raised that. I don't know if you're aware within the SG Tech Stack, there's a component called SGDS, which is the [Singapore Government Design System](#). So that's also where we put together some of the common design elements that designers can use. And I think in the future, we are also pretty much open to seeing how other designers within government can contribute back towards SGDS.

[Alicia] Charis, I also understand that you are a user of SG Tech Stack. Can you tell us about your experience?

[Charis] My product is actually [GatherSG](#). So we are kind of a suite of customer relationship management or case management products that really helps to optimise inter-agency collaboration and coordination.

So I guess one large challenge that we're trying to solve is when a citizen always goes to one agency, they might have to repeat the same story to multiple agencies, even though actually technically it's about the same issue. Because it's very hard for agencies to share data or correspond with each other. So I think GatherSG aims to solve that problem - to allow easier routing of cases, to allow agencies to coordinate and collaborate. Citizens don't actually use GatherSG directly. Our main users are actually public service officers or agency users. But I think it still benefits them (citizens) in multiple ways.

One of the examples that I think I can share would be the [Government Assisted Living Ecosystem](#). So GALE for short, is an ecosystem of sensors, products, software, hardware, that all work together to allow seniors to age in their home safely and independently. And I think one of our main sensors is called the [Personal Alert Button](#). So I'm not sure if you have seen like in some households, they have this little red button installed in the toilets or the bedrooms. For example if a senior, touch wood, they fall down or they experience health difficulties, they can simply press the button and the alert will be triggered. And it will be directed to an active aging center on the ground or an emergency helpline. Where GatherSG factors into this is that it's a system that powers everything, where all the different data and information from all these different sensors come in.

[Liyana] So it sounds like GatherSG is also a reusable platform, kind of like SG Tech Stack.

[Charis] Yes, actually now that you put it that way, I think we're kind of like a tech stack on your tech stack. So we are trying to see how we can expand and reuse the same modules, and same features in different sectors as well. So besides elder care, we have expanded into the social sector, where I think MSF* officers can

monitor and support rental households with families with young children. *(MSF* - Ministry of Social and Family Development)*

I think bringing it back to the building a BTO example, you can think of GatherSG as different flat layout templates, where agencies can just take that layout and then start living in the house already. Instead of having to design how exactly they want the house to look like.

[Michael] And next up, we have a game!

(Transition music)

[Michael] Now in front of us are Jenga blocks, and on each block there are questions for our guests to answer today. And you'll each take turns to retrieve a block.

We have question number five – Docker is a containerization platform used in modern tech stacks. True or false?

[Liyana] True. And it's also the technology we use in one of our SG Tech Stack products, C-Stack.

[Michael] Question seven – GraphQL is a database management system used in tech stacks. True or false?

[Charis] I think it's false because it is not a data management system. It's something else, but I'm not sure what that something else is.

[Michael] That 'something else' is a query language for APIs. So we use this query to query the API, and the API will pull the data from the database. So it's not a database management system but a query language for APIs.

All right. So it's one point to Liyana and one point to Charis.

Question number thirteen – Once you choose a tech stack, you can't change it. Is that reality or a myth?

[Liyana] A myth. So I think once you have a tech stack, you definitely can change it. It would take some effort to do some migration. And I think even in SG Tech Stack, we do migrate from one platform to another, because tech changes and you definitely have to change it. It will take some effort, but it's definitely doable.

[Michael] Question number eight – HTML and CSS are considered front-end tech stacks. True or false?

[Charis] True. That's definitely true.

[Michael] That is true. So they're both building blocks of building any web application or website, right? So yes. Two points each!

Question number fifteen – All developers should be full-stack to be effective. Is that a myth or a reality?

[Liyana] A myth. So you could have some people that are full stack developers, that's great. But you might have situations where you might need someone to specialise in front-end or back-end. So the ideal team setup would be a combination of all possibly, depending on the project.

[Michael] That's correct.

[Charis] *(to Liyana)* You won!

[Alicia] Good job! Definitely tech stack experts.

(Transition music)

[Michael] So Liyana, you know we work in tech, right? So how do we make sure our SG Tech Stack remains relevant?

[Liyana] Change happens all the time, right? For the SG Tech Stack, similar to any other product, we ensure relevancy by keeping in close contact with our community and our users.

In DevOps, there are a few pillars that we pay attention to, mostly looking at the processes, the people, and the technology. And the people are really very important. Over the past years, I've seen us grow communities, even like Telegram communities with our users, where people are kind of helping each other out, giving feedback, kind of helping people figure things out. I think moreover, nowadays, we also view agencies, and especially our industry/vendor partners, not as service providers, but as co-engineering partners. And it's not just lip service. Because as any product manager will tell you, your user is at the heart of your product, right? If you are not user-centric, that's really not a good product manager. And I like to think I'm an okay one.

So I think this whole effort of trying to make sure that we are co-engineering partners with our industry vendors as well as our internal communities, means that we take a very collaborative approach towards ensuring that there is improvements being made. And this is especially so as we move into the next phase of the SG Tech Stack, which is called the Engineering Productivity Program (EPP). With EPP, our real mission is to optimise government software engineering practices and enhance the developer experience. So really putting the developer at the heart of what we do. And I'm happy to share more about the EPP if we get a chance later.

[Alicia] A very high goal to achieve.

[Liyana] Very high goal, but achievable!

[Charis] Speaking of partners, also a big shout out to the STACK community. The STACK community is a really great community where people from the public sector,

as well as the private sector, can come together to talk about all things tech-related. Be it from data, to AI, to privacy or tech culture and more.

[Alicia] So you guys are the tech stack experts. Now, if somebody comes to you and asks you like "Hey, do you have any tips and how should I create my own tech stack?", what would you tell them?

[Liyana] Yeah, I don't know if we are experts, but based on my experience I did try to think what would be some tips I would give someone. So I tried to use the STACK acronym.

The first one is S. So I think it's always important to start with the problem in mind. Understand your users and then their needs, and understand what actually guides your tech choices.

Second, team familiarity. I think oftentimes you will find that most teams come with some kind of background and they may be more familiar with some tools than others. So look at what are the tools the development team knows and enjoys using.

Then the next one is A, which is for me, adaptability and scalability. So find technologies that are flexible, that can scale, that can grow with your project.

C is for compatibility and collaboration. So we spoke a lot today about how even with GatherSG, there's seamless integration across government for different use cases. I think it's really important that the components you choose can integrate quite seamlessly.

The last K, I cheated a bit, K is for keep security in mind. Opt for secure and well-supported technologies and ensure that these are future-proof technologies as well. So I think if we maintain S-T-A-C-K, we'll be fine.

[Alicia] Cool. You actually came up with an acronym to talk about tech stacks. That's really nice.

Did you face any challenges when you were building up the tech stack, especially as you're talking about scaling over the past four years? How did you guys overcome it?

[Liyana] So within the SG Tech Stack, I manage like three different products and my products are at different stages. For the products are at the very early stages, often your challenge is trying to make sure that your product is meeting what the market needs, what the agencies require.

The funny thing is, as you go along, when your product matures, so for example [SHIP-HATS](#) is one of our more established products with 5,000 users. But even with SHIP-HATS, we often face the challenge of having many requirements from different agencies. So I recall when we were kind of transiting from one platform to another platform for one of our products, we chose a certain platform and not everyone was happy with it. But we had reasons why we chose that platform, and so we went ahead with it. I think another challenge and what sometimes keeps me up is the point about metrics capture. As we mature, there's of course this greater pressure for

us to make sure that we are actually quantifying what's the benefits and the outcomes of the SG Tech Stack. And similarly, different metrics matter to different stakeholders.So we're always trying to find the balance between how do we quantify some of these benefits.

[Alicia] You talked about how the tech stack improves and stuff, right? So now the big change that has happened is GenAI has come onto the scene. How does the SG Tech Stack take into account GenAI and maybe possibly democratising GenAI use?

[Liyana] We recently went on a study trip to different companies and we were joking that if you didn't have AI in your product presentation, you probably are not in the tech industry. One example that we are working on quite strongly is that we are trying to see how we can enable more software engineers to have access to more tools such as coding assistants. What we are trying to do is to see how these tools enable what we call baseline productivity. So for an individual developer, how does this tool help him be more productive?

The next level we are looking at is to see how these tools can be transformative. Does it mean that in the future with the augmentation of AI, it means that developers can maybe perform in smaller teams as opposed to larger teams? We've already kind of debunked the fact that AI will replace developers and engineers, that's totally, I think right now, totally out of the picture. But AI would definitely augment the resources we have today. Do you want to hear more about the next phase of SG Tech Stack?

[ALL] Yes!

[Liyana] So we are looking at the Engineering Productivity Program (EPP) as I shared earlier on. So there are three key areas that we're looking at. The first one is looking at system modernisation. How can we enable more agencies to make use of cloud capabilities? The second area is of course developer productivity. So that's where we're looking at how we can enable developers to have access to more tools that enable productivity like AI. And the third area we're looking at is system resiliency. So now that you have your tools on your cloud, you have your applications developed, you're more productive, you do need to ensure that your systems are resilient, especially in a government context where we have a lot of very important services. So system resiliency looks at things like uptime, looks at things like shortening incident response time. All (of us) at the SG Tech Stack engineering productivity team are hard at work trying to roll out the next bound of the SG Tech Stack.

[Alicia] Sounds really exciting. See, Michael is like excited.

Thanks Liyana and Charis for the insightful sharing.

[Michael] If you're keen to find out more about the SG Tech Stack or resources of what we have discussed, you can check out our site at https://go.gov.sg/GovtechDecoded.

[Alicia] If you enjoyed this episode, do support us by sharing it with others and on social media. You can also connect with our speakers on their LinkedIn pages and follow GovTech on our social media platforms at https://go.gov.sg/ConnectWithGovtech. We'll leave the links in the description. I'm Alicia.

[Michael] And I'm Michael. And we'll catch you in the next GovTech Decoded.

(Outro music)