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Pulse of the Smart Nation

Every city has its own unique rhythm.

The hustle and bustle of rush hour, the interactions between people and organisations, the resources created and consumed — these aspects form the signature of a city and reflect the needs and aspirations of its inhabitants.

Just as a doctor might take the pulse of a patient to make a general assessment of health, policymakers could listen to the heartbeat of the city to address pressing problems and improve the wellbeing of their constituents.

This is what Singapore seeks to do as it embarks on its journey to become a Smart Nation.

“A Smart Nation is one that is capable of identifying citizens’ needs, in order to create or adapt services to meet these needs,” Professor Lim Ee Peng, Director of the Living Analytics Research Centre (LARC) at the Singapore Management University (SMU), told TechNews.

“At the same time, a Smart Nation should optimise the use of public, private and people resources to create a knowledge-based economy.”

While Singapore’s Smart Nation ambitions might sound bold and daunting, Professor Lim said that, in essence, there are just two parts to the complex equation: Sensing and making sense of behaviour. Sensing the Smart Nation

We use our five senses to gather information about the environment.

Similarly, a Smart Nation requires sensors that can collect data about behaviours and habits of its citizens.

Hence, to fulfil the first half of the equation — sensing behaviour — data acquisition platforms are key, and they can be broadly classified into two categories: social sensing and urban sensing.

Social sensing refers to the gathering of data from social media and personal devices.

The average person spends approximately 30 percent of his or her online time on social media, and 60 percent of social media browsing is facilitated by smartphones.

Thus, social media platforms represent a treasure trove of data that can reveal insights into interests and emotions, Professor Lim explained.

On the other hand, urban sensing is the monitoring of urban services such as transportation and utilities. One example of this would be the fare card readers on public buses and the gantries in train stations.

As commuters tap in and out of the public transportation system, data is being logged in an organic manner, allowing transport authorities to sense what is happening on the ground.

Alternatively, urban sensing can be performed by encouraging individuals to volunteer data about themselves.

Usually, this entails providing some form of tangible benefits to the volunteer, such as greater convenience or cost savings.

“Beeline [a bus ride booking app] is one such platform from the government sector,” said Professor Lim.

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“Commuters signal demand via the app, and new bus routes are crowdsourced based on commuter needs so that private bus operators can be engaged to ply these new routes.”

The meaning of data

Having a huge amount of data is meaningless without the tools to analyse it effectively.

To fulfil the second half of the Smart Nation equation, data mining and visualisation software must be created alongside data collection platforms.

At LARC, methods such as multimodal data integration, location profiling, urban behaviour analytics and deep content analytics are being developed to parse the voluminous data generated from social and urban sensing.

Given the breadth and depth of information available, extracting value from the facts and figures can be a tedious task if performed manually.

Hence, LARC has its own supercomputer — the NVIDIA DGX — to handle extremely large and complex datasets.

“By making sense of all this data, we can determine the unmet needs of citizens and perhaps even predict their future needs,” said Professor Lim.

“Specific shortcomings in existing urban services can be pointed out, and the performance or quality of these services can be monitored in real time so that adjustments can be made.”

Ultimately, the goal is to create a feedback loop that aids in the development of data-driven solutions, Professor Lim explained.

He added that some of these solutions can even be optimised by simulation before being implemented, thereby reducing the cost of trial-and-error.

Accepted by everyone

Although Smart Nation initiatives are focussed on and driven by technology and data, one aspect that should not be neglected is societal acceptance.

That is, everyone must take in in their stride.

“Like other technologies, data mining can be beneficial or detrimental, depending on how it is used. Applied correctly, you can have product recommender systems, intelligent chatbots and personalised health apps—smart options to cope with purchase, information and dining needs,” said Professor Lim.

“But in the wrong hands, data mining can also compromise data privacy, creating problems such as spyware and spam.”

Nonetheless, Professor Lim feels that fear should not paralyse progress, and that there is a need to foster an innovation-friendly environment where people are willing to try out new Smart Nation technologies.

He believes that gearing Smart Nation initiatives towards improving areas such as public health, skills training and career planning will increase the likelihood of these initiatives being embraced by the general public.

“When the benefits of these services far exceed the risks they come with, I am optimistic that people will adjust their data privacy expectations,” Professor Lim concluded.