

## IPS Closed-Door Discussion on “Preparing for the Future Economy: Developing Innovation in Singapore”

*Wilfred Lau*  
*IPS Research Assistant*

ON 18 April 2017, the Economics and Business research cluster organised a Closed-Door Discussion as a follow-up from the 2016 Action Plan series spearheaded by the Institute of Policy Studies (IPS). The guest speakers for this event included InnovatorSG’s Victor Alexiev, Nvidia’s Simon See and Wellspring Investments’ Mark Lee.



### Highlights:

- There is a need for more collaborative work between local firms
- To enable local companies to gain expertise and capabilities, they need to be afforded the opportunities to work on larger projects
- For the next generation to develop a more adventurous and entrepreneurial mindset, significant changes need to be made to the education system

- While government grants are plentiful, there are some flaws that need to be reviewed
- As a country, we should rethink the way we treat failure and social safety nets

## Panel Presentations

### Victor Alexiev, InnovatorSG

After a brief recap of Action Plan Singapore, Mr Alexiev discussed the proliferation of Artificial Intelligence (AI) as a key critical uncertainty in Action Plan Singapore. While it is certain that AI would be a major game-changer in several industries, its effects were largely unknown. Presently, many previously available jobs, such as factor work, driving and accounting, are gradually being phased out or changed by the development of AI. In several locations globally, other ways of integrating AI into existing job functions, such as mail delivery and driving, are also being tested. Mr Alexiev viewed this not as a complete displacement of jobs, but as functions and tasks being replaced by machines.

For jobs, Mr Alexiev explained three general categorisations of displacement: Complete replacement, partial augmentation and task replacement. Jobs that are at the highest risk of displacement are ones that are heavily task-oriented. In policymaking and discussions, rational agents within the market are responsible for these changes, even if the instinct is to place the blame on the technology. In the past, availability and accessibility of technology and resources have led to widespread change. In the present day, the same is true, except that the resources come in the form of data. Though data is not tangible, many industries can stand to profit by learning to employ data in more useful ways. Also, when it comes to direct fact-checking, access to knowledge is easier than ever, which means that cost predictions are cheap and easily accessible.

Mr Alexiev also outlined three waves of AI assimilation in the workplace: Codified knowledge, which is currently at its peak; statistical learning, which would peak over the next three to five years; and contextual adaptation, which would peak over the next five to 10 years. With each wave, what happens is a gradual increase in the ability of AI and machines to make judgment calls, potentially better than humans, due to superior data-processing capability. The result then is economic structuring, as AI eventually subsumes an increasingly wide range of tasks. Correspondingly, this will change ideas of what value means to firms, governments and individuals.

Mr Alexiev believed that the future depends on generating new revenue streams, optimising cost functions, reducing risk, and building a culture of innovation. As new value models are formed by society, the definitions of value creation, distribution, currency and sharing, among other things, will change. Having a culture of innovation is essential in keeping up with these changing times, he added.

### Simon See, Chief Engineer, Nvidia

Mr See began his presentation by showing participants an overall picture of the current state of AI. Modern representations of AI still undergo constant change because the technology is still in its early phases — such as image recognition and deep learning (e.g., self-driving cars that over time learn to recognise obstacles and lanes). AI has also been helpful in

pathology, and other areas of medicine where more human error occurs. In this sense, AI is not meant to replace a doctor, but to help them come to a decision. This indicates that in many ways, AI is still passive and unable to make judgment calls. However, we are now moving towards generative AI, referring to the ability to generate ideas. Mr See gave the example of AI that could imitate art styles, with the next step being text-to-image recognition. While generative AI is not yet mature, it is usable but still holds much promise.

Looking towards the future, Mr See spoke more about the learning capacity of AI and its potential in driving new discovery. There have been several iterations of AI learning to play games, from old Atari and Pong-style games to open-information board games as Chess and Go, and now, even Poker, a game heavy on intuition and judgment. In all of these cases, the AI would start out poor, but given enough time, could beat even prominent experts at their respective games. Within the realm of games and cognitive activity, this opened up possibilities for AI to serve as a learning device for aspiring players, and Mr See was confident that in the future, AI could be downsized into a smartphone, so people can carry an AI in their pocket. With massive amounts of AI learning to do the same things and sharing knowledge, there is great potential for technological development, and it is even possible for AI to eventually build other AI, he added.

Looking at the present, Mr See noted increased interest in AI and deep learning startups, with universities also launching their own initiatives. Companies are also interested in how they can use their manpower with AI to displace tasks in the near future. On the research end, companies are beginning to employ top researchers and, in some cases, taking them away from universities.

### **Mark Lee, CEO, Wellspring Investments**

Mr Lee focused on the necessary conversations relating to innovation that should happen in policymaking, and what could be done to raise and develop innovation in Singapore. Within the innovation scene, there are Small and Medium Enterprises (SMEs) who are key stakeholders by virtue of their deep but narrow technical expertise. However, for a lot of SMEs, there are a myriad of factors that inhibit innovation, including a lack of capital and talent, unclear rewards, stretched resources and mindset issues.

Mr Lee then said that SME owners and key management should be exposed more to AI and innovation, as current programmes are shallow, and hence unhelpful. Also, strong linkage with the local startup ecosystem is essential. While there is a lot of money flowing through the system, the money is more abundant than good ideas. The result of that buying bad products and services with grant money. The question then is how to tweak the system to improve the utilisation of money.

Mr Lee said that very little money in the system is currently suited for high-risk usage, something that does need to change. While Singapore's debt market is huge and generally risk-averse, the money however should be expected to produce new innovation and huge leaps, which is contradictory. High uncertainty, high risk, information asymmetry and soft intangibles are key problems in tech financing, and Mr Lee believed that venture capitalists bring a lot to the table to address these issues.

However, he also believed that better policy measures could be implemented to help venture capitalists extract more value out of tech innovation. Some of the key needs of venture capitalists included more capital, a better environment and better strategies to attract capital from overseas. On human capital, Mr Lee said that unlike in 1965, where good administrators were needed in Singapore, good innovators and entrepreneurs are needed now. More importantly, Mr Lee also said that it is important to get a more diverse, more savvy mix of people to participate in the conversation with regard to innovation and policymaking.

Mr Lee added that innovation in general is a complicated and sometimes chaotic process, with a lot of its best efforts coming at the grassroots level. To support innovation, the government should be familiarising itself with more of these grassroots movements and rethinking the way it has been supporting innovation and entrepreneurship. Because public administration should not be expected to also be industry experts, policies need to be examined more closely to reduce this human error.

## Discussion



One of the key themes that arose during the discussion was that of cultivating an innovative mindset in our students. For Singapore to have the minds and the manpower necessary to prepare for the future economy, inculcating a will to learn, an impetus to try new things and a lack of fear of making mistakes is extremely important. However, the current education does not prioritise this and changes do need to make to reshape the mindsets of students. The current local economy is built on working with Multinational Corporations (MNCs) and science and technology skills. It also places a large focus on results rather than processes,



which is problematic in a future where soft skills, such as humility, leadership and communication are not emphasised in schools. As a result, a lot of fresh graduates who enter a job market where these skills are valuable often find themselves poorly equipped in the soft skills department. In this respect, parents and schools do need to be more supportive towards the development of soft skills over hard ones.

Participants also expressed concern at the general definition of success in Singapore. With failure being heavily stigmatised in general, and yet inevitable for everyone, there should be more focus about dealing with and learning from failure, especially when resilience, experimentation and curiosity are seen as desirable traits for the future economy. For innovation to happen, companies agreed that collaboration is a big part of any potential innovation movement, be it public or private. This stigmatisation against failure can also hinder the building of these relationships, as individuals and corporations alike feel the need to hide their failure. For innovation and important linkages to be formed, trust between businesses and between individuals is especially important, and addressing the way we think about failure can be a big part of building this trust.



Another issue that inhibits business innovation is related to the stigmatisation of failure, as mentioned above. Because of a perennial fear of failure and the ways Key Performance Indicators are measured, many local companies, even the large ones, do not embark on innovation initiatives, and instead expect the government to take the lead on everything, which is not a tenable situation for anyone. At the same time, expecting MNCs to spearhead innovation is also problematic, as MNCs for the most part are in Singapore to take advantage of the lower cost or to use Singapore as a base for expansion to the rest of the

region. To expect them to help to build up local companies would also be problematic. Thus, the general attitude toward risk and failure does need to change. In that vein, it is possible that individual safety nets would also be important, so that individuals would be more inclined to take business risks with the knowledge that their personal livelihood is not at stake.

On the government end of things, participants identified two key issues regarding business innovation. The first was the engagement of SMEs. While there have been great strides in getting high-end technology into the country, movements to translate this technology into usable means of production for SMEs have been rather lacking, and they are not being furnished with the right information to embark on these movements. The second issue is the way grants and innovations interact with each other. A participant suggested that the best SMEs succeed not on grants, but on passion and foresight. While the large range of grants available are encouraging, the general fear is also that firms would be unwilling to innovate without them. Even then, another participant added that while a lot of money was being put into grants, most of it was not well spent, partly due to a lack of ideas, collaboration or expertise. In that respect, in some cases companies need the acumen and the assistance to innovate rather than funds.

On human capital, a participant said that while the talent pool is not short on creativity, companies are not prepared to accept people who think out of the box, or reward them for their creativity. This creates a dangerous entrenchment that kills creativity and innovation at the corporate cultural level. In that way, the general consensus was that Singapore as a whole does need to adopt a more experimental mindset, a different approach to giving aid to companies, a more open discussion about innovation, and a better way to reward talent for being innovative.

*[Wilfred Lau](#) is a Research Assistant with the [Economics and Business](#) cluster at IPS.*

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*If you have comments or feedback, please email [ips.eneews@nus.edu.sg](mailto:ips.eneews@nus.edu.sg)*



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