



Start-up to scale-up – the story of two nations: Israel and Sweden

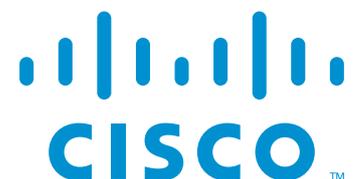
2017 Higher Education and Research Study Tour

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Foreword

“Universities are pivotal to the future of both Australia and Israel. As innovation economies, the capacity to create, disseminate and commercialise knowledge and technology is critical. The Australia-Israel Chamber of Commerce was pleased to lend its support to this study tour, recognising that the chances of economic and social success are increased for both countries through active collaboration. Well done to Cisco – this was an inspired program demonstrating the value of industry and university collaboration.”

Leon Kempler, National Chairman of the Australia-Israel Chamber of Commerce

“Despite their geographic distance, Australia and Sweden have much in common. Both countries recognise that past economic success is no guarantee of future performance. Both understand that capturing opportunities in a digital world will depend on our ability to innovate and be entrepreneurial. The role of universities has never been more important and the Australian Embassy in Stockholm was proud to support this visit, and the important contribution it made to building long-lasting, warm and productive connections between Australia and Sweden.”

Jonathan Kenna, Australian Ambassador to Sweden

Purpose of the study tour and format

The 2017 Higher Education and Research Study Tour involved 17 senior executives from 13 universities across Australia. This means that approximately one-third of Australia’s universities were prepared to travel to two of the world’s most innovative countries to better understand what was happening, and what could be learned and applied in Australia.

Australian universities on the study tour



UNIVERSITY OF WOLLONGONG AUSTRALIA



Israeli and Swedish universities involved in the tour



Organisations visited as part of the tour: Cisco Israel, Israel Landing Pad (including Ben-Gurion University), StarTAU (Tel Aviv University), Bar-Ilan University, Ericsson, Things, SUP46, ICT Arena and Stockholm School of Entrepreneurship.

In Israel, the focus was on Start-up Nation, driven substantially by the country's global leadership in technology, cyber security and mindset to think global first. In Sweden the focus was innovation, digitisation of its economy and entrepreneurship, including the incredible transformation of Stockholm, which has become one of the world's most vibrant start-up and entrepreneurial scenes. 2017 marked the seventh annual higher education study tour designed and facilitated by Cisco. The event is a demonstration of global best practice co-operation between industry and universities, and is intended to stimulate new partnerships and opportunities.

Why leading countries, institutions and citizens care about digitisation and innovation

Digital technologies are impacting on every aspect of our social, academic and working lives. Digital is rapidly creating new possibilities but also new challenges. For every new job created by digital, about 2.5 positions disappear, mostly through automation. We have seen this pattern play out in industries such as media, and information and communication technology. In the digital economy institutions and companies have a stark choice: stand still and risk the prospect of being displaced or embrace change and move forward.

Israel and Sweden are two countries that realise creation of new, sustainable jobs for competitive advantage will be possible only by embracing digitisation.

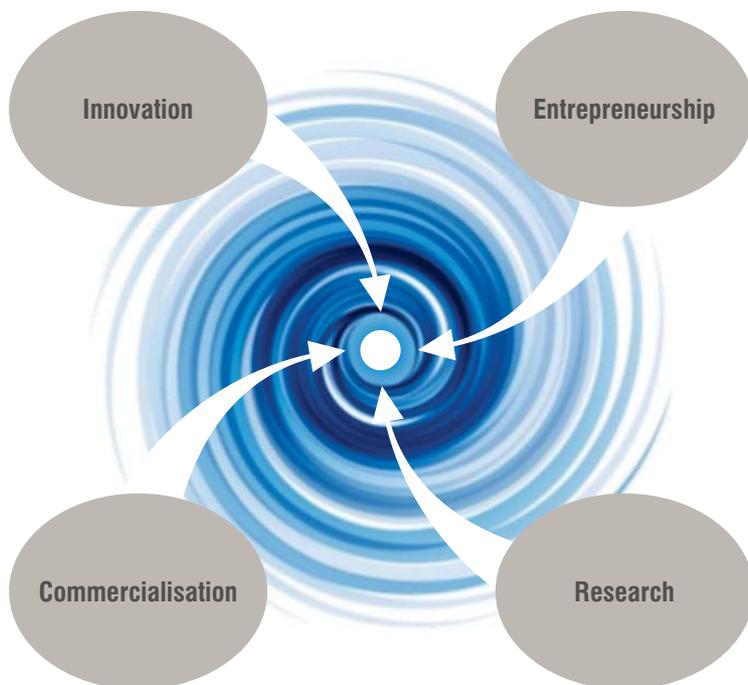


Figure 1: Precious commodities in a digitally disrupted economy and society

How Israel and Sweden are capitalising on digitisation and innovation

1. People expect to create their own jobs

In both Israel and Sweden people spoke of the importance of a start-up mindset. Young people in both countries are increasingly expected to take control of their own economic future to a greater extent than generations before them. This was particularly true in Israel, where people spoke proudly of the importance of being fearless in developing and commercialising products and businesses.

Explanations for the start-up 'mindset' varied. Some suggested that the current generation of school leavers were emboldened by the achievements of entrepreneurs before them. Others argued that it was easier to be an entrepreneur today than ever before given the scale and speed of technological change, lower barriers to entry and maturing support networks for those starting and growing their businesses. In any case, digital is now considered a basic enabler of how people work, learn and live, creating new possibilities for young people to define and create their own work futures.

A vibrant Stockholm start-up ecosystem

For a population of one million, Stockholm's start-up performance is staggering. The city gave birth to seven 'unicorns' (companies valued at more than US\$1B), including Spotify and Skype. It is ranked one of the most innovative cities in Europe and globally. According to the Executive Director of the Stockholm School of Entrepreneurship, Rasmus Rahm, the performance is not due to any single player or event, but the sum of Stockholm's parts (demonstrated in Figure 2). Accelerator and co-working spaces such as SUP46 play a particularly vital role in creating the glue that holds the ecosystem together.

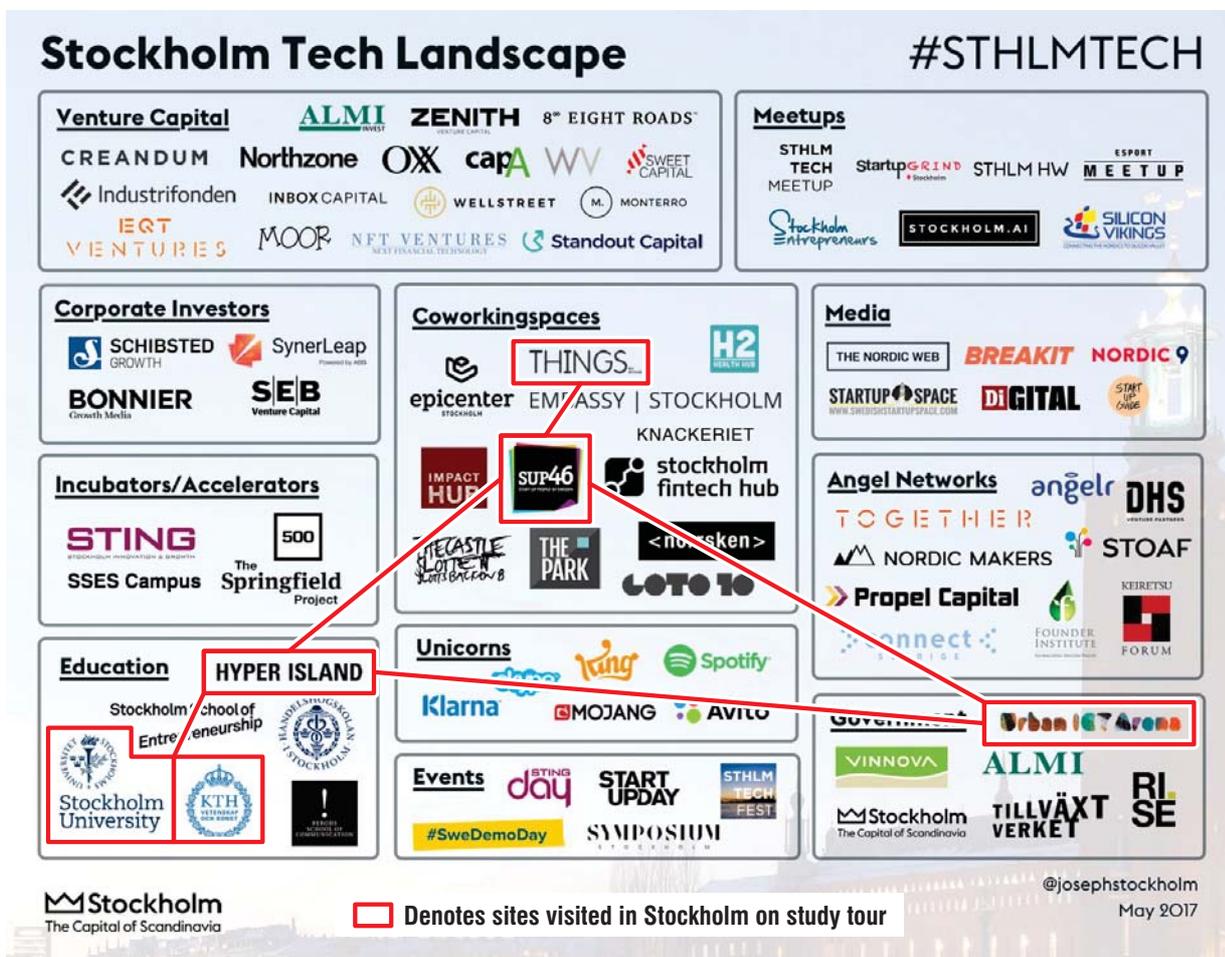


Figure 2: The diversity of Stockholm's start-up ecosystem

Another explanation for Stockholm's success is the ease with which companies can do business in Sweden. Sweden now ranks number one on the Forbes annual list of the Best Countries for Business¹, compared with the US in 23rd place.

“Over the past two decades the country has undergone a transformation built on deregulation and budget self-restraint with cuts to Sweden’s welfare state.”

– Forbes Magazine

2. Economic success is increasingly linked with emerging platform technologies

Sweden and Israel have identified specific platform technologies to anchor their innovation and entrepreneurship efforts. The focus on smart cities is an example of how nations, cities and regions are trying to work out how to use new technology to extract more value from existing infrastructure. This includes use of the Internet of Things, analytics, automation and blockchain technology to improve the efficiency and effectiveness of transport, lighting, energy and citizen-facing services. The developments in 5G technology showcased by Ericsson on the tour provide a window into the range of future ‘smart’ applications – many of them with the potential to transform the cost base and business models for universities and their campuses.

Israel's focus on cyber security draws on its military capability but that is not the whole story. Israel has put deliberate measures in place to capitalise on its expertise, including attracting multinational research and development activity and allowing top talent to retain intellectual property for research conducted while in the military. Israel is now focused on using its cyber security leadership to push new frontiers of knowledge and value creation related to artificial intelligence, crypto-currencies, big data and alternative reality technologies.

Profile of a cyber security Goliath:

- **350 active cyber security companies**
- **200 cyber security companies founded since 2013**
- **Annual reports of \$3.5B (5% of global market and second only to United States)**
- **In 2015, Israeli cyber security companies raised \$500M (15% of global VC)**
- **Three of the largest cyber security companies worldwide are Israeli (Check Point, CyberArk and Imperva)**

Figure 3: Israel's cyber security Goliath

The notion of technology platforms as ‘anchors’ for economic success was also discussed at length at Bar-Ilan University. The university has identified the areas of artificial intelligence and machine learning as a ‘deep learning boom’ it is seeking to exploit. While fundamental research was critical, the focus at Bar-Ilan was increasingly on research that can be implemented.

Sweden's technology platform focus was not cyber security or machine learning but the Internet of Things (IoT), which is sometimes described as the second internet. Sweden's history in advanced manufacturing makes IoT a compelling proposition given that the increased use of sensors will make everything that Sweden produces even smarter.

An example is the automotive sector, where Sweden has three global brands (Volvo Cars, Volvo Trucks and Scania). Working with companies such as Ericsson (120,000 employees globally), auto companies have been able to differentiate on technological excellence. Delegates inspected a car equipped with more than 200 open APIs – a number that barely scratches the surface of what's possible. Smart cars are opening up a range of unexpected opportunities, including a supermarket chain in Sweden experimenting with deliveries to people's cars – rather than houses – using an API that provided single-event, keyless access to the vehicle.

1. <https://www.forbes.com/sites/kurtbadenhausen/2016/12/21/sweden-heads-the-best-countries-for-business-for-2017/#26933f797ecd>

THINGS: a start-up hub for makers

Magnus Melander is the founder of THINGS. His vision was to create capacity for Stockholm and Sweden to embrace the intersection of the physical and virtual. His view was that IoT was the technology most likely to build an industry on. He collected start-ups across Sweden that had IoT capability and co-located them at KTH University in Stockholm in the THINGS 'house'. That stable of companies is now 38 strong, with six companies sold to multinationals in 2017 alone. What is unique about the facility is that it does not take equity from companies but charges a modest rent for access to prototyping facilities, a small workshop (laser cutters, 3D printers) and accommodation.

Companies are creating hardware using IoT, 3D printing and robotics to make products as diverse as drones for mines and equipment capable of cleaning the ocean of plastics. One THINGS start-up demonstrated its 'visual voltage' power cables. The cables light up when they are drawing power and make the invisible visible, encouraging people to turn off appliances when not in use or fully charged.

"Apart from being an incredible innovation platform I believe IoT will also make it easier for people to move horizontally between industries."

– Magnus Melander

3. Universities treating industry as investors, not donors

The relationship between multinationals and universities is changing. Cisco and Ericsson spoke of the shift towards fewer, deeper partnerships with universities. Trust, transparency and the capacity to be involved in a continuous conversation were critical. Cisco, which traditionally had a buy, build and partner strategy when it came to innovation for growth, spoke of a major shift towards co-design of products and investment. This approach had challenged Cisco in a number of ways, but also placed greater demands and relevance on its university partners. University partnerships are no longer about donating time, expertise and money: Cisco treats it as an investment that needs to generate a return for all parties (see Figure 4).



Figure 4: How Cisco now invests in universities and the innovation ecosystem

"Our relationship with universities used to be about branding and access to students. Now they are a partner, including getting full access to our technology roadmap."

– Sandor Albrecht, Ericsson

StarTAU exploiting its network of potential investors at Tel Aviv University

Half of all entrepreneurs in Israel come from Tel Aviv University, and an increasing number are coming via StarTAU. Founded by Oren Simanian, StarTAU is an innovation hub and incubator for entrepreneurs. Universities play a number of important roles in entrepreneurship, including helping people get into the innovation ‘forest’ where they have access to networks, opportunities and tools.

“It is very difficult to be a successful innovator if you are outside the forest.” – Oren Simanian

Other important roles that universities play in the start-up space include internationalising the ecosystem, acceleration services, education (including non-accredited) and ‘the ability to see the future’. StarTAU had three major messages for universities focused on entrepreneurship:

1. Universities need to think about industry as investors, not donors.
2. The university’s most valuable – but under-rated – commercial asset was its community of alumni. Tel Aviv University had a 170,000-strong community, many of whom were potential investors if the right commercial model existed for them to make those investments.
3. The traditional technology transfer office model of commercialisation is broken. Universities were spending too much money and effort for too little commercial return.

4. Scale from the start

Israel and Sweden had one major factor in common – neither country saw itself as a market in its own right. Businesses operating in both countries needed to think global from the outset and their business and operating models were built for scale. Government policy was also oriented towards scale, particularly in Israel where government understood that moving from Start-up Nation to Scale-up Nation required access to global capital, talent, supply chains and for innovation to be embedded.

Israel by the numbers:

• MNCs doing R&D	400
• Venture capital funds	90
• Incubators	25
• Angels/micro funds	200
• Startups	5000+
• Accelerators	70

“One of the things we are seeing in Israel is an accelerant effect. When start-ups get bought out they don’t go and buy a yacht, they find another business – it’s in their entrepreneur DNA.”

– Omri Wislizki, Australian Landing Pad

The concept of scale was also applied at a regional level, including in Be’er Sheva in the Negev region of Israel, which produces one-third of Israel’s engineers.

The Negev: a regional approach to innovation

The south of Israel is largely desert but anchored by the thriving city of Be'er Sheva and Ben-Gurion University. The region sits at the centre of the country's cyber security industry and the city of Be'er Sheva was recently voted one of the top seven global hubs for technology.²

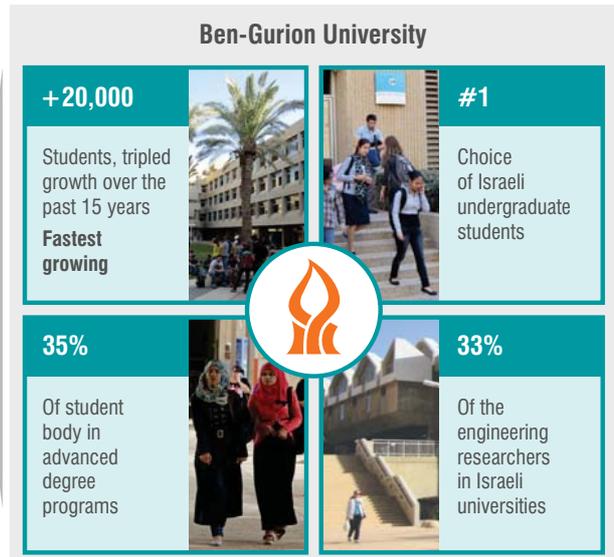
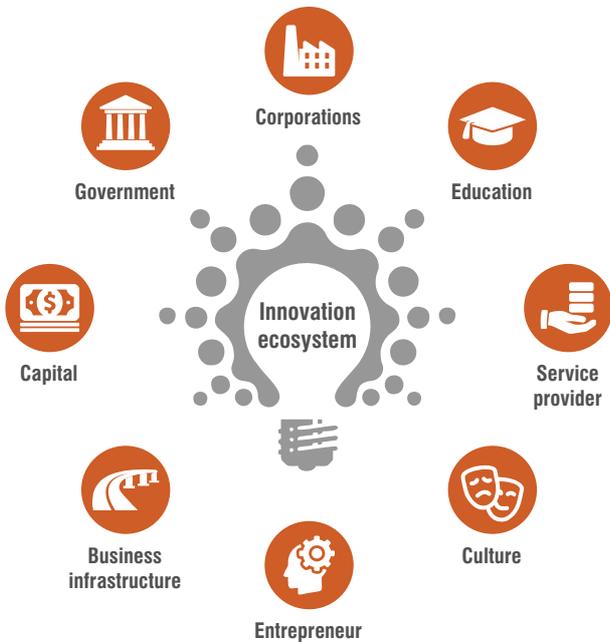
Seven cities poised for significant growth in technology and life sciences



- **Be'er Sheva, Israel**
- Campinas, Brazil
- Cape Town, South Africa
- Chengdu, China
- Istanbul, Turkey
- Kuala Lumpur, Malaysia
- Santiago, Chile

There are a number of explanations offered for the region's success, according to Ben-Gurion University's Yossi Shavit. These include:

- A clear economic plan
- Elevating the role of Ben-Gurion University as a regional economic anchor
- An ecosystem-based approach to innovation (see below)
- Involving the community in all innovation-focused events at the university



2. <https://www.brandeis.edu/global/news/2015/t3-brandeis-study.html>

The work at Ben-Gurion University is augmented with a range of other activity by government and industry. As an example, Cisco has also been involved in Israel's Country Digitisation Acceleration project, which includes provision of technology to people in the Negev. Cisco has been working closely with Sapir College to create Israel's first smart region; invest in digital media and video innovation; and build an ecosystem to deliver digital services to improve citizen wellbeing, create jobs and boost entrepreneurship.

5. Secure digitisation of universities to create a value fabric

Digitisation is largely about business models, service delivery platforms and people. But it is also about technology. The focus of institutions, including universities, is now to ensure they are equipped with the right technology underpinnings to be able to innovate at scale. The digital platform was described as a multi-dimensional 'value fabric', which Cisco Sweden country director Per Samuelsson suggested needed to perform on five fronts (Figure 5).

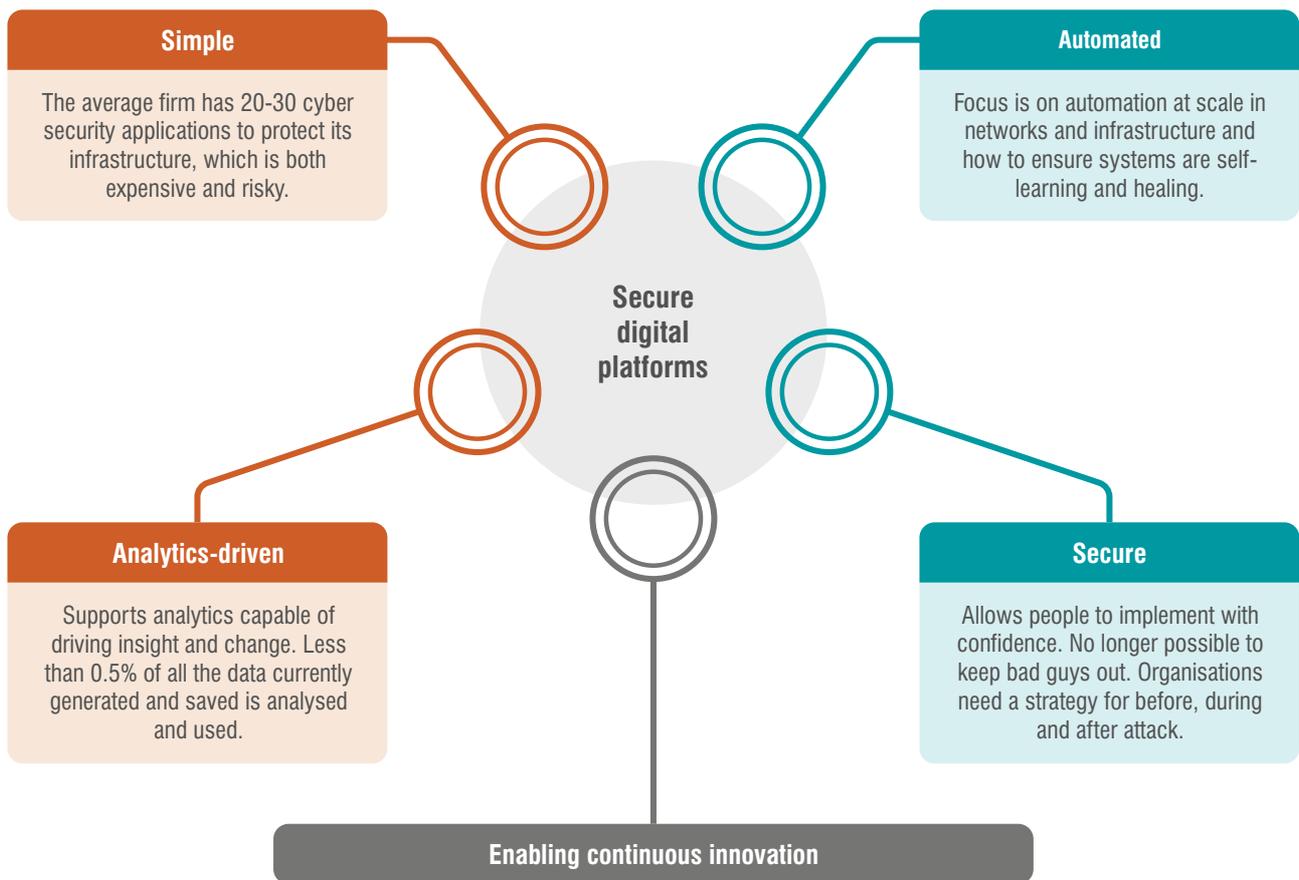


Figure 5: Profile of a secure digital platform

In Israel one of the most critical elements of the digital platform is cyber security. It acknowledges that today's threat landscape is a complex ecosystem where threats lurk in plain sight and cyber attackers are innovating as fast as anyone. So complex are emerging threats that 54% of attacks remain undiscovered for months and the average time to discover a threat is 100 days. The size of the threat is also important. Cisco scans 16 billion web searches per day and blocks four billion of those. To put this into perspective, Google processes only four billion searches a day. Perhaps most revealing is the fact Cisco detects 1.5 million cyber threat samples in its own environment every day – though its average time to detect is only 13 hours (not the industry standard 100 days).

"We are in an age like the Wild West – everyone fighting for themselves. A major challenge is deterring attackers, particularly when they are operating outside of the jurisdiction they are attacking."

– Prof. Yehuda Lindell, Head of BIU Center for Research in Applied Cryptography and Cyber Security, Bar-Ilan University

How Australian universities need to change in a digital world

Australia's challenge is to take the best elements of Israel and Sweden's approaches and create our own scale-up nation. The National Innovation and Science Agenda (NISA) provides a framework for what is required to build Australia's innovation capacity and output, including the role of universities. However, the study tour shone a light on some of the ways in which universities will need to change beyond the NISA framework. This includes the role of universities in helping Australia create a truly innovative and entrepreneurial mindset so that we can capitalise on opportunities. These roles are summarised in Figure 6 and elaborated on in the following text.

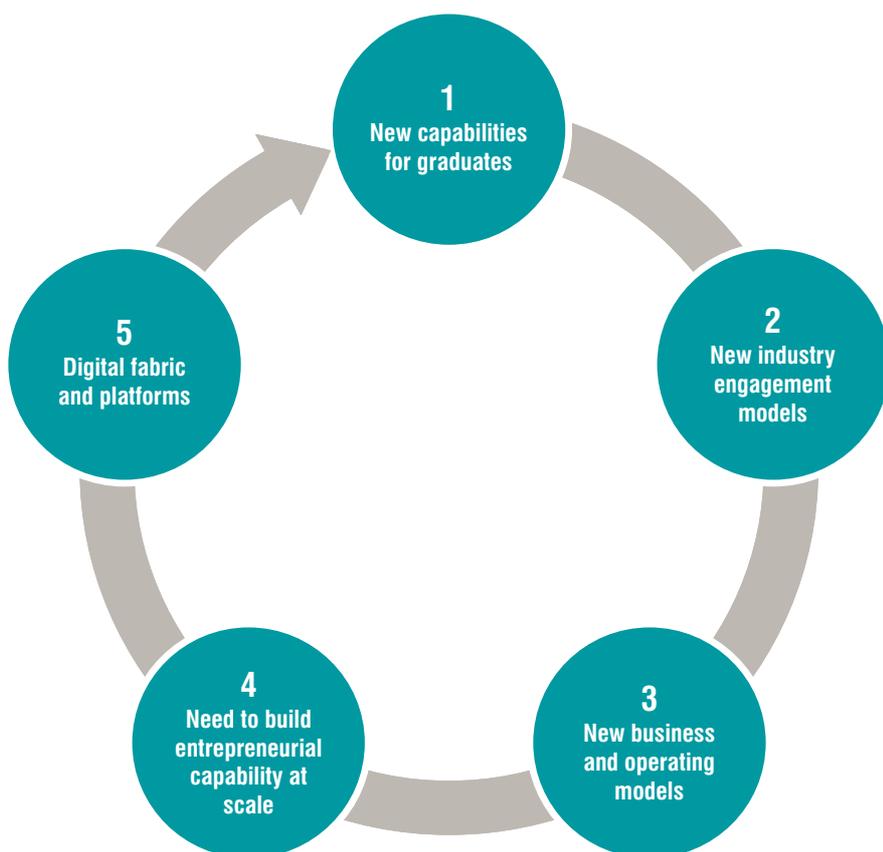


Figure 6: How universities need to evolve

1. Digitisation changes the capabilities required by graduates

The impact of digitisation on economies is changing the capabilities required by graduates. The focus is not just ensuring that graduates are job-ready but also business-savvy and entrepreneurially minded. In many circumstances (but not all) the importance of technical skills is diminishing but the need to understand how information, knowledge and trust flows in different directions is being elevated. Universities can play a role in helping communities re-think what a job is, including ensuring that ongoing learning is recognised as a legitimate part of their jobs and a necessary response to the pace of digital change. The only way jobs will be created fast enough is if we constantly focus on building capability and learning.

2. Digitisation changes the model required for industry engagement

The scale and pace of change mean that universities need a different relationship with industry, one based on co-design and investment. This means changing both what they do and how they do it. Petra Dalunde, Chief Operating Officer of Urban ICT Arena in Kista, Sweden, said its work with industry was guided by these principles:

- The process and result of collaboration has to be ‘not boring’
- We do things together or not at all
- Super-slim and agile
- Based on a quadruple helix model – the citizen being the fourth element (government, industry and academia are the others)

3. Digitisation must disrupt the university business and operating models

According to Claudia Olsson, Associate Faculty at Singularity University and CEO of digital transformation consulting firm Exponential, universities need to develop end-to-end strategies for a digital world rather than looking at technology as an augmentation tool. That strategy needs to contemplate new business models, which today have a lifespan of as little as 18 months. This will involve constant evaluation of how universities transfer value to students, industry and university itself (and how it is compensated). The emergence of blockchain technology (‘distributed digital trust’) is another source of disruption and attractive because it offers potential to improve transparency and trust. The disruptive potential of blockchain technology will be accelerated by simultaneous developments in artificial intelligence and IoT.

4. Digitisation creates space for universities to build formal and informal entrepreneurship

The Stockholm School of Entrepreneurship’s (SSES) success highlighted that a systematic approach to building entrepreneurship can deliver significant results, and there is a role for universities to play.

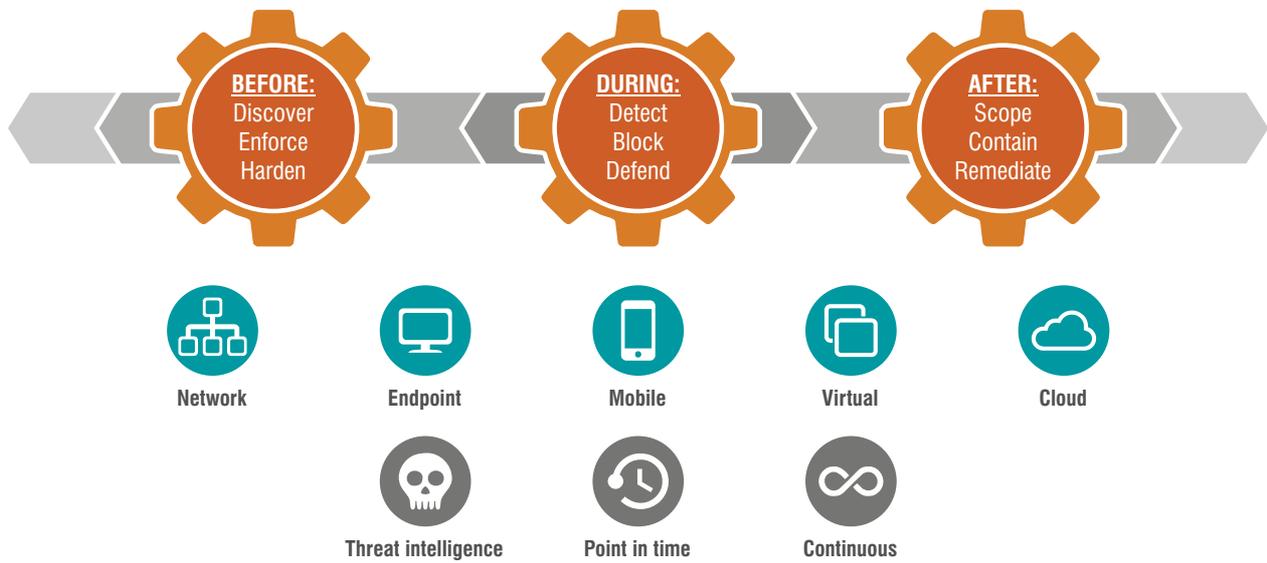
SSES focuses on augmenting work that is typically done in business schools. It is considered an entry point into Stockholm’s innovation ecosystem, running courses on weekends and in the evening including many non-accredited courses in presentation skills, negotiation skills, search engine optimisation and creative leadership. The SSES model is built on the belief that entrepreneurship awareness and knowledge is best achieved when learners are deep in their own home discipline.

5. Digitisation requires universities to invest in their own digital fabric and platforms

Cyber security is frequently described as an arms race, but innovation needs to be thought of the same way. The capacity to innovate at scale and more quickly than competitors is becoming a new battleground. When the Swedish Government’s European ranking³ in digital technology adoption dropped from 16th to 23rd in two years it was a cause for major concern and a precursor to major investment in smart cities. This type of realisation is occurring at the institution level as universities become more sophisticated in understanding how future differentiation will be delivered.

One of the most important areas of required investment is in cyber security, which has moved from being a compliance measure to an enabler of innovation. The threat landscape dictates that action needs to occur before, during and after an attack across a broad range of infrastructure.

3. European digitisation report



Conclusion

The benefits from digitisation are immense but not evenly distributed. Israel and Sweden are examples of countries that have embraced digital and the need to constantly change. Universities anchor the Israel and Sweden innovation systems but they, too, have been forced to change. Australian universities acknowledge they will have to do the same, and equip their students, researchers and own organisations for a digital world.

*“It is no longer sufficient for universities or companies to have a digital strategy.
They need to have a strategy for a digital world.”*
– Claudia Olsson, Associate Faculty at Singularity University and CEO of Exponential