

Accelerating Innovation in Shenzhen



INTRODUCTION

Satisfying consumers with just digital experience is passé. In this new era of smart technology, consumer dynamics and experience largely depend on more targeted, more responsive, and more intelligent digital services. As a result, software and hardware are converging further now more than ever. The leaders of today are increasingly looking for ways to ensure that the right teams in the hardware and software spaces meet and collaborate to capitalize on unique opportunities to innovate. The firms not aiming at this direction, risk missing out on opportunities to develop cutting-edge technologies opening up major revenue streams.

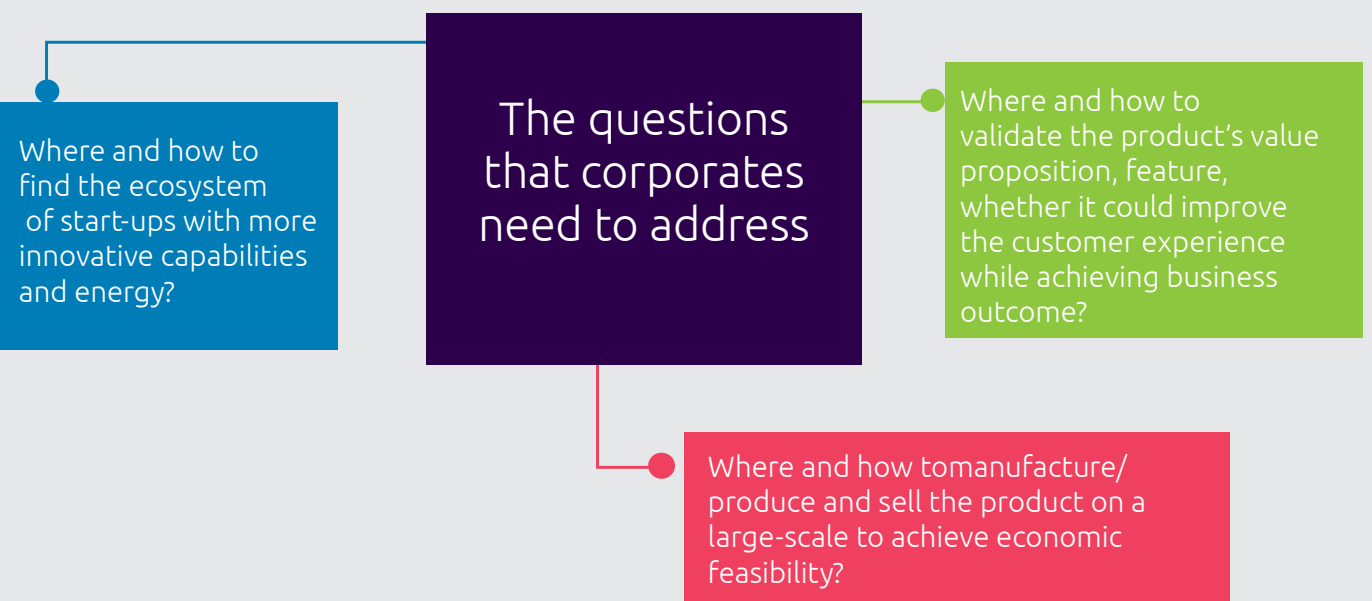
Large corporations are repositioning themselves to embrace emerging technologies, such as Industry 4.0, AI, and Big Data among others. The ability to integrate hardware and software innovations becomes a key competitive advantage in the market. In their quest to enter and thrive in new industries, firms are looking for ground-breaking platforms to support growth and innovation, where they could leverage the power of the start-up ecosystem with mature engineering and methodology capabilities to speed up the evolution process of a new product, service, and business model development.

Determining whether a new product is feasible for the market, can be slow and consume unreasonable amount of time, which limits the opportunity for testing ideas. But with China's next-gen hardware development ecosystem, especially that of Shenzhen's, speed is rarely an issue.

It is becoming more evident that China's vast consumer market and openness to new technologies make it one of the largest and most ideal new product pilot spaces. A quick feedback loop helps accelerate time-to-market for new hardware and software integrated products or solutions. This report explores some of the major challenges that corporations face in their efforts to innovate, and how Capgemini Applied Innovation Exchange and its Shenzhen ecosystem network can help address those challenges and hasten the delivery of results.

THE CHALLENGES BUSINESSES FACE TODAY

We reside in a VUCA (Volatile, Uncertain, Complex and Ambiguous) world where technology influences the way we live, communicate, create and garner knowledge, travel, listen to music, shop, and even how we start, build, or let go of a relationship. The biggest challenge for businesses today, is to enhance their technology and business model to stay abreast of the VUCA environment.



While finding answers to these questions, we found that Shenzhen (China) constantly pops up as the most suitable place for corporates to fulfil the criteria they envision.



'SINO-VATION': IS CHINA THE NEXT BIG INNOVATION HUB?

China is fast emerging as the innovation hub, especially among the Fortune 500 companies. Today, companies such as AirBus, ABB, Microsoft, Dell, Tencent, and a host of other behemoths have their branches in Shenzhen, leveraging the local ecosystem. Most of these companies have set-up their innovation centres across Shenzhen, especially in the Greater Bay Area

When it comes to hardware, Shenzhen is one of the most talked-about cities in the world today. Shenzhen is situated in the heart of the GBA, which is home to more than 75 million people, 90% of which comprise of privately-owned businesses. People come to the GBA to follow a dream, to make a fortune, and to invent cutting edge technologies. This 'gold-dust' city is attracting more and more corporations to set up offices within the region.

Aside from the vast amount of resources, speed, and expertise, the region also offers a deeper, more integrated ecosystem, which has powered innovation and gave birth to unicorn companies (Xiaomi, DJI, and Huawei). Not only is there an intersection between hardware developments, but also between software, AI, and hardware. As part of all future technologies, we envision a software-driven society, whereby innovation no longer stems from one specific area, but rather is a combination of hardware, software, and artificial intelligence. The future is here, and it's in Shenzhen.



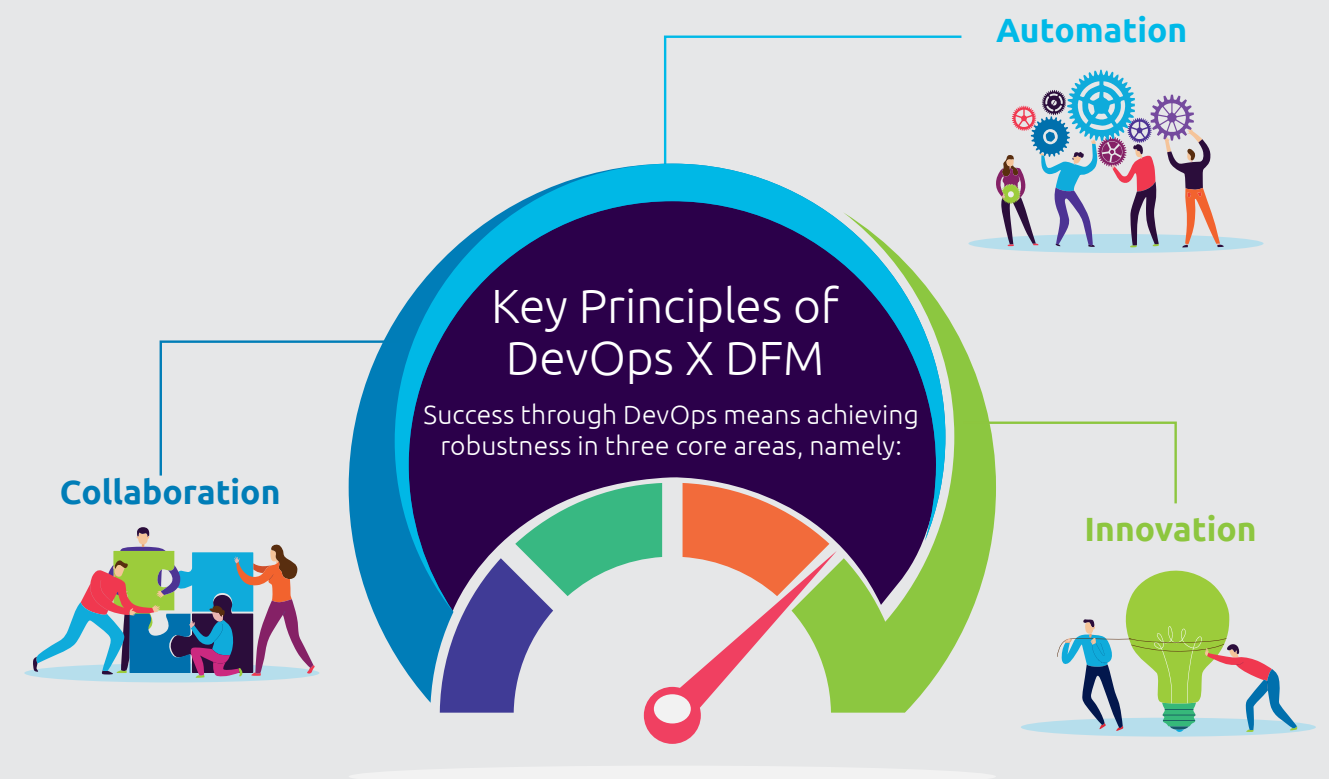
METHODOLOGY: THE 2-D COMBO (DEVOPS & DESIGN) FOR MANUFACTURING (DFM)

With more and more innovations requiring a combination of software and hardware (from Information Technology to Information plus Operational Technology), is it time to redefine the concept of DevOps? Should we be involving Design for Manufacturing (DFM, one of manufacturing engineering principles) in the DevOps concept?

Extending the collaborative culture of DevOps not only

involves software operation teams, and security teams, but also manufacturing engineering teams in the early stages of innovation. In the software development life-cycle, the early discovery of defects or faults could dramatically reduce the overall cost of ownership. In the hardware manufacturing process, this effect will be even more critical, as the change of cost for hardware is significantly higher than software.

While the latest digital technologies help us gain more data and insight about the customers' behaviours and their preferences in real-time; it comes with the flip side of the software and hardware products becoming more complicated. The capability of adopting and evolving the software and hardware integrated solution/products becomes the key competitive advantage in the market.



These three areas together result in increased communication and seamless flow among teams, thus resulting in faster delivery and reduced time-to-market.



COLLABORATION: WORKING AS A TEAM TO REALIZE A DREAM

Collaboration is all about how we perform inside an organization. When we talk about collaboration, we are talking about problem-solving with a group of people with different skillsets. This shortcoming is where DevOps enters and plays a crucial role by bringing together different skills of experts. DevOps bridges gaps between:

Development and Operation teams in software/IT

Design and Manufacture teams in hardware/OT



making them aware of each other's tasks. This results in quality checks at every step coupled with necessary testing, making the product all-ready at the end of the process chain. All of this means a strong collaboration.



AUTOMATION: A 'CODE' TO DECODE AN ENHANCED TECHNOLOGY



To handle the uncertainty during the innovation process, the iterative approach is the way to increase the learning based on previous success or failure. Automation is the key to reducing the cost and uncertainty of innovation by "hard-coding" the experience and knowledge of process without introducing the man-made pitfall. Automation (not only on the software's CI/CD process but also the manufacturing process), enhances the quality and experience manifold.

By leveraging the latest cloud technology, we could achieve "Everything as Code", including the infrastructure as code, development and deployment process as code, even the maintenance process could be automated by scripting. From the manufacturing engineering point of view, the more processes could be automated by robotics and PLCs, the higher predictability and reliability of the manufacturing process could be achieved, especially for the iterative innovation approach.

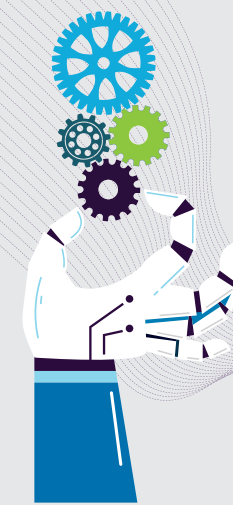


INNOVATION: GIVING WINGS FOR A COMPETITIVE EDGE

Assured results in quality and production naturally minimize the majority of pressure coming from the product development life cycle, thus leaving space for innovation. Innovation plays a pivotal role in giving companies a competitive edge in the market. DevOps gets companies all possible ways to drive innovation. By minimizing the time taken for process execution in its way, DevOps allows business decision-makers to handle the uncertainty introduced by new ideas, with the certainty from DevOps's robust and reliable software and hardware product life cycle.



CASE STUDIES



AUTOMOTIVE:

Working with a major global automotive OEM client's brand in China, Capgemini was able to implement a variety of equipment failure prediction systems for equipment such as welding robots, tip dressers, servo motors, etc., and flexible cable burn outs, as well as glue leakage prediction. The data for flexible cable burn out prediction include welding process data, welding set-up data as well as fault and failure history. Leakage prediction includes filling the application head of greasing robots and dozers.

This proved to be an important case for Capgemini. The downtime in our client's car body shop amounted to losses of ~ USD 22,000 per minute, but after implementation, we were able to predict failures 24 hours in advance and saved 500 minutes across 600 dozers per week.

In contrast, SVV has worked with companies like RoboSense, an AI company using Li-Dar technology for self-driving vehicles. SVV's capabilities were able to considerably increase the prototyping and production of these sensors, allowing for better speed and quality, increasing the deployment phase. Capgemini looks forward to scaling up this technology to other user cases and replicating these results across other automotive plants in China

RETAIL:

The innovative idea has proven to be effective for one of the largest global furniture companies, in Europe with small scale proof of value (PoV). It takes three months for the Chinese team to implement the solution [1] with Capgemini while leveraging the easy access hardware equipment with online shopping malls. It has been proven with several large-chain stores that the 3D/AR solution can improve the sales revenue per customer by 20% while reducing the sales assistant's time spent on each transaction from 25 mins to 10 mins.

As the next step, Capgemini AIE and SVV are helping the client standardize and industrialize the 3D/AR solutions, and deploy it globally by improving its manufacturing engineering technologies and standard components. This way, the total cost of ownership for global scale deployment could drastically come down to an economically feasible level.

ROBOTICS / IOT:

When we talk about robotics and IoT, we see emerging companies such as Dorabot, leveraging Shenzhen's local resources and embedding themselves within the local ecosystem. Dorabot is a robotics and logistics company greatly improving packaging efficiency through its machine vision technology.

It is not uncommon to find such advanced technology companies within China's GBA. Dorabot was founded in 2014 and develops automated warehouse solutions using cutting-edge AI and robotics, including computer vision, motion planning, mobility, deep learning, etc. Covering induction, sorting, transportation, and loading, they provide end-to-end solutions for logistics, express mail, e-commerce, seaports, airports, manufacturing and other use-cases.

COLLABORATION: SHENZHEN AIE AND SVV

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Applied innovation framework

Witness every step of the way

DISCOVER
DEVISE
SUSTAIN
DEPLOY

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DISCOVER

DIGITAL ROADMAP

Emerging technologies, new services and business models

How do we select innovation ideas for business value?
How do we translate Digital strategy in an innovation roadmap?

DEVISE

POC/POV/MVP

New Digital Service

How do we rapidly develop a proof of value or a minimum viable product?
How do we check business ROI?

DEPLOY

INNOVATION GOVERNANCE

Service Beta Version

How do we involve stakeholders to engage in the innovation deployment?
How do I quickly deliver the innovative service?
How do I deploy a sustainable innovation program?

SUSTAIN

CONTINUOUS INNOVATION

How do we build innovation capabilities in line with strategic objectives?
How do we ignite open innovation? How do we fill the digital talent gap?
How do we onboard the whole company into the digital transformation?

Discovery and Exploration Space



A journey to a new digital world

Iterative Upgrade of Innovative Products



Software and hardware combined innovation

Local Innovation Ecosystem



AIE Shenzhen "Hub"

Global Applied Innovation Exchange Network



Gather global intelligence

CAPGEMINI AIE MANIFESTO

Knowledge is capital

With Capgemini and the innovation ecosystem, we can provide the knowledge, expertise and skills covering the whole product lifecycle, which increases the chance of optimizing the solution and product.

Innovation, brilliantly applied, is gold.

The focus of AIE and our ecosystem is not on the innovation itself, but on how to apply the innovation to create business outcomes for our clients.

But innovation without application is a proposition for bankruptcy.

The well-designed value proposition validation process is a critical part of AIE, which accelerates the learning about the impact of the application of innovation on the value chain and network. With these learning, we could reduce the risk and uncertainty of innovation, while maximizing the value of learning.

This is a profoundly uncertain, perpetually disruptive marketplace.

By working closely with the ecosystem and leading start-up and unicorn, we can help our clients be aware and stay relevant to the constantly changing marketplace.

The risks are real, yet the opportunities are immense. Amateurs need not apply. Choose your guide wisely.

Our mature innovation service portfolio provides the framework and structure to systematically manage the risk of innovation. With our professionals and trained expertise, we can achieve better with failing faster approach, and accelerate learning and experience.

Finding and applying the most relevant innovations for your industry and business is a team sport. Stack your bench with deep vertical expertise. Scout the wide universe of innovations to fill an ever-evolving playbook.

AIE leverages a world-class innovation research capability, and Capgemini along with our ecosystem's expertise, network to provide advice and assistance to support not only the clients' software and hardware innovation process, but also the management and business model area

Become technologically omniscient.

AIE insists on the generalist talent development principle, and is open to different technologies, while applying the scientific evidence-based evaluation approach focuses on the business outcome, instead of technology fashion.

Check your preconceptions at the door. In choosing innovations to apply, your only bias should be toward creating business success.

Never stop discovering. Be endlessly creative in applying your discoveries.

Applied Innovation changes everything.

SHENZHEN VALLEY VENTURES

SVV's unique business structure has allowed it to significantly accelerate the development process of hardware while maintaining high levels of quality. In parallel, the company has also created a one-stop end-to-end flexible hardware and manufacturing platform. SVV has 50+ in-house hardware engineers and a tier-one, 70,000 square feet manufacturing facility supporting the production of low-volume complex B2B devices.

Founded in 2016, the company has a strong background in manufacturing since 2004. The same year, the founders of SVV had also co-founded one of China's largest manufacturing companies. Once the founders made an IPO in 2010, they came together to form SVV 6 years later. SVV has accomplished an integrated end-to-end platform, designed solely to support start-up & corporate innovation.

Their new facilities in Shenzhen's Cloud Park have pioneered something which has not been seen before in China. A fully operational tier-one manufacturing facility on the 9th floor of an office building. The facility which can sustain low-volume production, and focus on complex devices such as, medical, agriculture, sustainable and AI integrated IoT devices. Innovation thrives off flexibility and suffers under tedious procedures which larger corporations use. SVV's platform, facilities, and expertise have together become the game-changer everyone's been looking for.

CONCLUSION:

Capgemini Shenzhen AIE provides the unique capability to support the hardware relative innovation with the following approaches:

Leveraging the Chinese mass-market space for product piloting and experiment

Speeding up the product life cycle with Chinese openness on the data

Leveraging the mature supply chain/network and small volume manufacturing capability to reduce the cost of failure and accelerate the time-to-market

Rapidly deploy, test and scale innovations in a cost-efficient, risk-mitigated way.

Sustain innovation efforts through cultural, leadership and in-house proficiency development.

AIE Shenzhen is committed to Connect, Collaborate, Share and create brand-new innovative solutions in collaboration with our partners and our clients in our ecosystem.





About Capgemini

Capgemini is a global leader in consulting, digital transformation, technology, and engineering services. The Group is at the forefront of innovation to address the entire breadth of clients' opportunities in the evolving world of cloud, digital and platforms. Building on its strong 50-year heritage and deep industry-specific expertise, Capgemini enables organizations to realize their business ambitions through an array of services from strategy to operations. Capgemini is driven by the conviction that the business value of technology comes from and through people. It is a multicultural company of 270,000 team members in nearly 50 countries. With Altran, the Group reported 2019 combined global revenues of €17 billion.

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