Opportunities for the Semiconductor Industry in the

DIGITALIZATION ERA

Meet the Changemaker

The Rise of Compact High Launched Performance GaN-on-GaN

Wisdom of Developing a Global Perspective

SSIA
Singapore Semiconductor Industry Association

SSIA SUMMIT 2020

Opportunities for the Semiconductor Industry in the Digitalization Era

29 & 30 SEPT | 2.00PM TO 5.00PM

Free Online Event
- A platform to look at how digitalization and automation will drive the semiconductor industry.
- Get insightful sharing on how to transform to seize the new opportunities in the digitalization era

GUEST OF HONOUR

Mr Alvin Tan
Minister of State for Trade & Industry and Culture, Community & Youth

EVENT DETAILS

www.ssia.org.sg/summit2020

SSIA
Singapore Semiconductor Industry Association

Foreword by Executive Director

W hen I am writing this article, it is already late September, and Singapore has been touched by the outbreak of COVID-19 for eight months. I believe 2020 is an unusual year for you and me, as well as for most of the businesses. Although countries are restarting more aspects of normal life, we are emerging into a new normal.

Disruption and opportunities are two sides of the same coin. While business operations of our industry have been affected by the pandemic and global trade tensions, many companies have managed to embark on or accelerated their I4.0 transformation journeys. The increasing number in hiring has further proved the resilience of the industry.

At SSIA, we are heartened by the support from the industry for our events launched in the past few months, including the Automation Supplier Day, Supply Chain Conference, and different dialogue sessions with Minister and government agencies. We strive to stay relevant to the needs of the industry.

The strong participation at the events motivates us to pursue the necessary agendas for our industry, and ultimately to grow the semiconductor ecosystem.

I would like to take this opportunity to thank the sponsors of the SSIA Summit 2020, an SSIA's flagship annual event. Though it will be hosted on a virtual platform, we hope the event will bring valuable insights into digitalization trends and trigger necessary strategy plannings in companies embracing these global megatrends.

Last but not least, I would like to invite all SSIA members to join our AGM on 26 November 2020. It will be an important meeting for SSIA as we will elect the new Board. The Board will be crucial to continue leading SSIA in making more transformations possible.

I wish you an enjoyable read.

Thank you and Stay Safe!

CONTENTS

SSIA Supply Chain Conference

Supply chain disruption caused by the US-China trade tension and the pandemic is one of the biggest challenges faced by companies in our industry. This was the feedback obtained during the Singapore Semiconductor Industry Association (SSIA)'s industry wide pulse survey. A Supply Chain Conference was virtually held on 27 August as a platform to initiate discussions on supply chain disruption as well as opportunities that can be created from this situation.

The event started with the opening speech from SSIA Executive Director, Ang Wee Seng. He said, "Many of the larger MNCs may have developed strategies and plans to address the supply chain matter both short-term and long-term. However, the bigger concern is how will the SME fit into this plan, and what opportunities can businesses in this industry create out of this challenge?"

6 speakers were invited in the event to discuss about trends on how the supply chain disruption was transforming business' strategies, and how major companies were addressing this matter.

Supply Chain Challenges Survey

During the Supply Chain Conference, a survey about the current challenges facing the companies was conducted among the participants. 75 responses were collected. Over 70% of the respondents said they were facing supply chain challenges caused by the pandemic and trade tension, and over 80% expressed digitalization would be part of the long-term strategy for the supply chain management in their companies. Most companies needed information on current relevant policies (63%) and funding to implement digitalization solutions (51%).

Moving forward, SSIA will work to understand the needs from the semiconductor and will launch more initiatives to support companies in tackling the challenges and seeking the necessary assistance.

Highlights of the Conference

Critical Industry at a Defining Time

John Neuffer, President and CEO of Semiconductor Industry Association gave a high-level overview of the unique challenges facing the semiconductor industry and its supply chain from a policy perspective. Challenges included the pandemic, decoupling risks, the China challenge, rising costs of innovation, demand for high-skilled talent, and government incentives.

Evolution of Global Supply Chain and Its implication on Manufacturing in SEA

Dr Mousumi Bhat, Senior Director of External Manufacturing, Micron Semiconductor Asia talked about how COVID-19 and trade wars reshaped the supply chain and how businesses should reframe themselves for sustainability. She also shared the strategies in achieving resiliency.

Perspectives on Supply Chain Challenges in Times of COVID-19 and Trade Tensions

Daryl Hatano, Vice President of Government and External Affairs of ON Semiconductor, shared his company's strategies in adjusting its logistics, operations, and other aspects of its business to cope with the different challenges.

Digitalization: Reimagining Asia Pacific Supply Chain

Steve Walker, Asia Pacific Chief Information Officer and Chief Operating Officer of DHL Supply Chain, presented the structured digitalization effort to scale up innovation across operations globally. He also introduced their digital twin technology deployed in a customer warehouse. Another speaker from DHL Supply Chain, Eunice Hew who is Head of Operations in Singapore, shared how they have kept supply chain operations running during the challenging COVID-19 period.

Solutions That Can Interlink Both Supply Chain & Logistics to Unify Supply & Demand

In the presentation of Louis Ferretti, Project Executive of IBM Global Procurement for Environmental, Risk and Compliance Programs, he showed how a tight organizational interlock across Procurement, Supply Assurance and Logistics increases the resiliency of the supply chain and ensures supply continuity.

Assistance Needed to Tackle the Supply Chain Challenges

SSIA
Singapore Semiconductor Industry Association
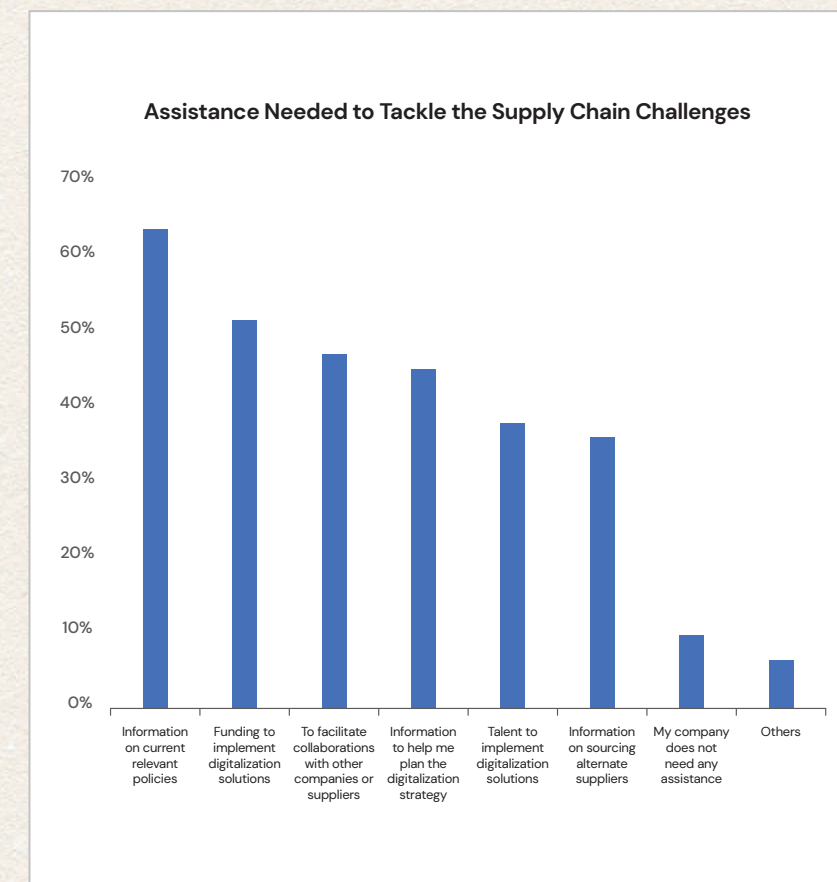
Upcoming Electronics & Industry Relevant Courses

BACK BY DEMAND

Data Analytics for Electronics Industry
Co-organized by SSIA & SP
28 September 2020

The objective of this course is to equip participants with knowledge of fundamentals of data analytics. Participants will also be able to apply these analysis tools to their data when designing and developing their future intelligent systems for the electronics & semiconductor industries. There would be hands-on session with the data analysis tools such as data wrangling, visualisations, regression models and prediction. Participants can apply the knowledge and skills to help improve their operational tasks and increase work productivity

Who should attend?
All engineering technical or personnel

Eligible for SKILLFUTURE CREDIT

IoT for Electronics Industry
Co-organized by SSIA & SP
2 October 2020

One day classroom/practical session to equip participants with knowledge of the internet of things (IoT), IoT applications and its eco-systems used in the semiconductor/electronics manufacturing industry. There is a hand-on session for particaipants to apply their knowledge

Who should attend?
All engineering or technical personnel

Eligible for SKILLFUTURE CREDIT

Introduction to Industrial FMEA
Co-organized by SSIA & SP
2 October 2020

The objective of this course is to equip participants with the knowledge of Failure Mode and Effects Analysis (FMEA), a step-by-step approach for identifying all possible failures in a design, a manufacturing process, an equipment, or even a service. Participants will also have the opportunity to work on real-life case studies where they will learn how to create a proper risk assessment, prioritise the different critical levels of risk, and trigger necessary mitigation actions.

Who should attend?
Technician, Associate Engineer/Assistant Engineer, Equipment Engineer, Maintenance Engineer

BACK BY DEMAND

Industrial Cost Optimization
21-22 October 2020

This online course, held over 2 days, will cover cost saving measures based on technical engineering data analysis as well as statistical evidence

Who should attend?
All personnel in charge of optimising company's materials spending, equipment maintenance spending as well as energy required for production

BACK BY DEMAND
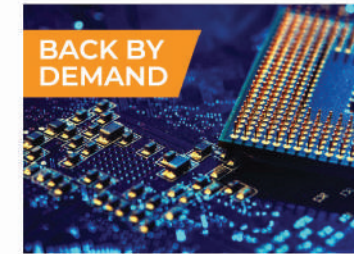
Semiconductor 101
9-10 November 2020

This 2-day online course enables the learners to gain knowledge of the journey of semiconductor manufacturing from sand to finished chip. Students will understand the eco-system and how all of them come together to support the semiconductor industry

Who should attend?
Non-technical audience who wants to know a high-level overview of semiconductor devices and how they are fabricated

NEW

QMS101
17 November 2020

The course covers the fundamentals of quality systems, and how each component supports the overall architecture of the QMS. It gives a general overview of how to implement these systems in the company

Who should attend?
Non-technical personnel in the semiconductor industry

Eligible for SKILLFUTURE CREDIT

Wafer Fabrication in Semiconductor Industry
Co-organized by SSIA & SP
Date to be determined

Interactive 3 day course with classoom sessions and practical laboratory work that provides participants with the relevant knowledge and skills of the Wafer Fabrication process in the Semiconductor manufacturing industry The courses are conducted in person

Who should attend?
Those who recently joined the semiconductor industry or engineering techinical or personnerl under the Eletronics Skills framework

If you are interested to customize an in-house course for your company, or for any other enquiries, please contact daphne@ssia.org.sg

Scan the QR code for more details

Meet the Changemaker

For Singapore's rapidly-evolving semiconductor industry, change has been the only constant over the last five decades. Singapore Semiconductor Industry Association (SSIA) Executive Director Ang Wee Seng, who spent two decades in the sector before taking on the challenge of leading its transformation two years ago, talks about the impact of COVID-19, SSIA's strategy going forward, and how he envisions the future of the manufacturing industry's most promising sector.

Covid-19 has left a large number of sectors gasping for air. Semiconductors seem to have bucked the trend. Why is that?

Semiconductors are playing a central role in the ongoing digitalisation wave, with the Internet of Things, cloud computing, and emerging segments like AI driving its growth – and at phenomenal rates. This is why the industry remains one of the bright spots in Singapore and in other major global economies despite the pandemic. SSIA's commitment to continuing to drive transformation within and beyond the sector will ensure our continuing success.
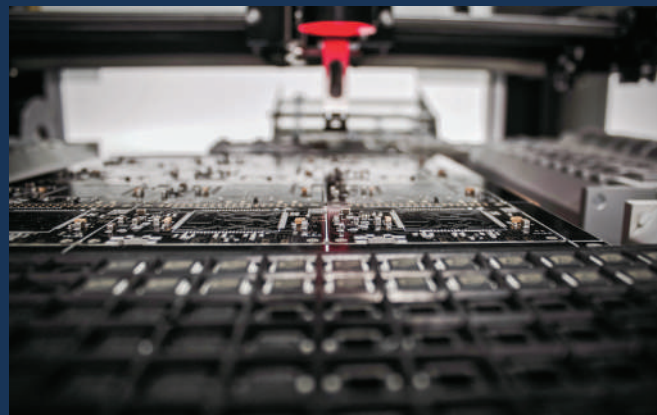
The semiconductor industry remains one of the bright spots in Singapore's economy amid the ongoing pandemic.

The sector has grown impressively over the last five decades. How has that picked up of late?

Over the last 52 years, the sector has steadily climbed up the value chain to a point where we have almost the entire semiconductor ecosystem represented in Singapore. We have the top foundries, the best R&D teams and the biggest names in the industry here. The semiconductor industry was one of Singapore's first high-tech industries and contributes roughly one third

to Singapore's manufacturing output. And its growth is far from done, , both at an industry and national level. Though the industry has not been spared from the impact of COVID-19, it is still taking advantage of the huge opportunities brought by growth drivers such as 5G, IoT, smart factories, and autonomous vehicles. Singapore's Electronics Industry Transformation Map (ITM) will drive further productivity through three pillars: productivity improvements, innovation in product and services and, most importantly, development and growth of the talent pool.

5G, IoT, smart factories, and autonomous vehicles will ensure that the demand for semiconductors remains robust

You've been charged with "transforming" the sector through SSIA over the last two years. What has that entailed?

In early 2018, SSIA's Board assembled a team to ensure that our work took on even more relevance and impact, and to drive change through the sector in accordance with the ITM framework and its three pillars of development. Workforce development has become our foremost priority – ensuring that there are strategies

in place to woo the brightest and best to the sector, and draw on the experiences of sector players and retired or retiring industry stalwarts to showcase the promise of the sector. This has been core to ongoing initiatives, and will form a key part of upcoming campaigns planned to excite potential industry hires. We hope to also receive support from industry leaders in terms of their participation and feedback on SSIA's initiatives to make the Association and its initiatives more relevant.

Does SSIA have an overarching strategy for enabling the sector going forward?

There is no one-size-fits-all strategy for our sector, given the diverse needs of players, especially between MNCs and SMEs. Some want to push aggressively on the digital front, while the focus for others is enhancing workforce capabilities or holding on to their competitive advantages. There is a need to grow the local ecosystem further, as we believe this will strengthen the overall industry here and attract more investment. Therefore, helping the local SME will be SSIA's focus as part of the strategy moving forward. Our Automation Supplier Day, for example, helps SMEs grow their networks and connect with bigger players in the industry. The Supply Chain Conference in August 2020, our first event addressing the current supply chain challenges, helped bring valuable and updated information to different companies. As the sector regroups and charges ahead in the next few quarters, we will push these events even more aggressively.

An ecosystem strategy can help both MNCs and SMEs advance in their priorities

Give us a hint about the upcoming recruitment campaign planned for the sector – how are you going to ensure you draw the brightest and the best?

Because chips are tiny, many do not realise exactly how mighty they are. They are central to everything many people use, need and enjoy on a daily basis, from mobile phones to gaming consoles. We will give the humble chip and the hidden stories of Singapore's illustrious semiconductor sector – and its heroes – their rightful place, front and centre. As someone who began his career in microelectronics and has had a chance to work on products like Microsoft's Xbox, what I can assure is that the stories are plenty.

Wooing future talent to join the semiconductor industry will be SSIA's key focus going forward
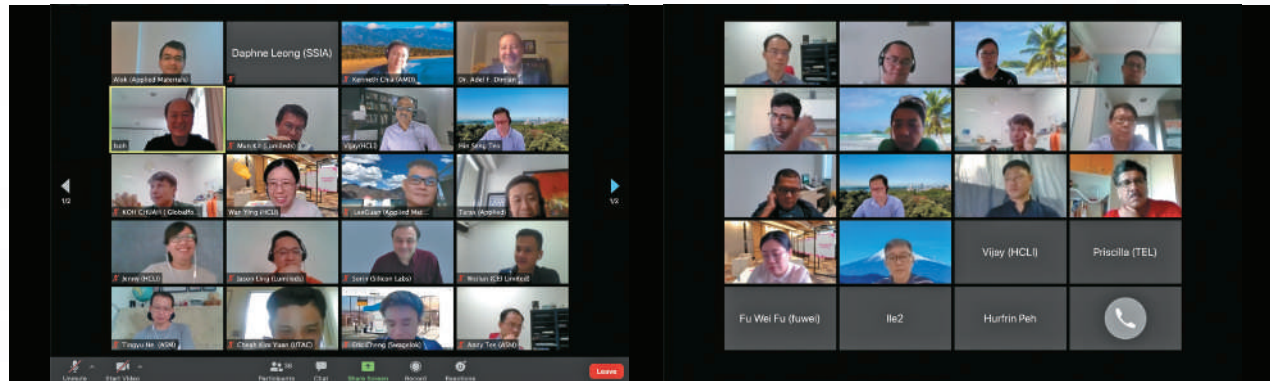
Singapore Semiconductor Leadership Accelerator (SSLA) – Final Run Nurturing Leaders In the Semiconductor Industry

SSIA launched the 5th Run of SSIA Singapore Semiconductor Leadership Accelerator (SSLA) Programme, in partnership with the Human Capital Leadership Institute (HCLI) on 27 July 2020.

Four years ago, our government and industry leaders from the semiconductor and electronics sector came together and decided to accelerate the development of a pool of leaders who would bring the semiconductor industry forward into the future. With that in mind, they launched the SSLA programme which was partially funded by the Economic Development Board (EDB) of Singapore. SSIA so far successfully implemented 5 runs for over 100 local leaders.

SSLA is a custom programme designed to inspire industry leaders to continue creating revolutionary possibilities. The programme brings multiple voices from business, consulting, academia and provides a platform for an exchange of insights and points of view for leaders to think beyond the obvious and immediate. It is also an opportunity for leaders to interact, debate and dialogue with thought leaders and industry champions, and to build strong networks with colleagues from diverse companies.

The 5th run starting from July was the final run of the SSLA programme. Due to COVID-19, the programme was redesigned to deliver in a blended learning approach that combined face-to-face classroom and virtual learning activities. New elements and relevant topics such as the macro environmental trends, leadership agility, topics on Industrial 4.0, have been added to the

final run. On 4 Aug 2020, Mr. Soh Lip Leong, General Manager at ams Sensors Singapore was invited to share his insights, stewardship and experience with the new cohort of SSLA participants.

It is one of SSIA's mission to drive the Industry Transformation Map (ITM) focusing on driving productivity, helping companies innovate their products and services, and most importantly, developing the talent pool of the industry. SSIA will launch other leadership programmes and campaigns in 2021 to accomplish these goals. More details will be available at SSIA website soon.

Relevant topics to the current business landscape have been added to the SSLA 5th Run

Testimonials from participants of the SSLA 5th Run

Help consolidate the challenge of multigenerational workforce. Give us handles on interacting with our workforce. (Trust / motivation/ performance & reward)

Timothy Chan,
Director, Account Sales, Silicon Product Group, Applied Materials

Human management is one of the skill-sets which is hard to learn and needs to be highly adaptable and flexible when dealing with people of different characteristics. The session shared by Tan Hwee Hoon dives into the various approaches which i find it enriching and broaden my scope of human interaction and management.

Lee Wee Loon,
Section Head (Mechanical Design), CEI

Many good insights regarding people management. As technical / sales / operations, we might not have this sort of management exposure in our daily course of work.

Eric Cheng,
Sales Manager, Swagelok Singapore

Very insightful and lively engaging sessions.

Sorin Badiu,
Senior Engineering Manager, Silicon Laboratories

Ardentec Singapore Pte Ltd:

'The Enabler of Key Test Technologies to Keep the IC Industry Progressing as Moore's Law Predicted'

Ardentec, a wholly owned subsidiary of Ardentec Corporation in Taiwan, was founded on June 15, 2006, to provide professional semiconductor testing services. Being the extended arm of Ardentec Corporation Taiwan (as a strategic location) in South East Asia, the company is dedicated to providing its regional customers with better services through a shorter cycle time as to meet their demand and towards total customer satisfaction.

"We hold the attitude of integrity and the spirit of continuous improvement towards total customer satisfaction and strive for the innovative testing technology."

DEVELOPING THE MINDSET & RESILIENCE OF A GAME CHANGER

OCTOBER 15 - 16

9:00am to 1:00pm
2-day Live, Online Course

Do your people have the passion, commitment and inspiration to drive your transformation agenda? This course will empower participants with the right strategies and mindset.

- Understand what emotional intelligence is and how it affects your resilience, adaptability and effectiveness in driving your organization's transformation agenda
- Master emotions and manage stress more effectively
- Develop a proactive and positive, solutions-focused mindset

Course Details & Registration

SSIA
Singapore Semiconductor Industry Association

make possible a
better future

APPLIED MATERIALS®
make possible

We are the leader in materials engineering solutions used to produce virtually every new chip and advanced display in the world. Over the next decade, AI and Big Data will transform major industries and every aspect of our lives. Applied Materials is uniquely positioned to help enable this future by accelerating innovations from materials to systems.

At Applied Materials, we help make possible a better future through the power of technology. We believe innovation happens by combining technology and talent in new ways. We don't see the limits of what we can achieve, and neither should you.

Take the next step. Join us.

appliedmaterials.com

OPPORTUNITIES FOR THE SEMICONDUCTOR INDUSTRY IN THE DIGITALIZATION ERA

N ew digitalization trends are diversifying the demand for semiconductors. The semiconductor industry plays a critical role as both consumer and manufacturer of digitalization solutions coupled with emerging technologies like 5G, the Internet of Things, and artificial intelligence. The era of digitalization will significantly grow the industry.

The digitalization trends will change the business landscape and bring enormous opportunities to the semiconductor industry in the next few years. Semiconductor industry players need to develop strategies to better adapt to the demands of the digitalization market. Companies should balance solving challenges for the short-term while focusing on innovating their products and services in order to stay competitive in these evolving trends.

Leveraging 300 mm Technologies at 200 mm for IoT and Automotive

The IoT and automotive markets use devices fabricated at a wide range of technology nodes. Taking advances made at 300 mm and applying them via upgrades to 200 mm equipment is a cost appropriate strategy to quickly improve yield and add capacity.

The industry is no longer held captive by sales from computing applications, such as personal computers, servers or even cellular phones and tablets. A diverse range of markets are contributing to growth seen by Lam and our customers. Cloud storage, machine learning or artificial intelligence (AI), virtual reality (VR) and augmented reality (AR), robotics, medical and automotive, including the emergence of autonomous vehicles are all key application fuel for the industry's engine. Yole Développement believes that, by 2035, more than 50 percent of all vehicles sold will have level 3 autonomy. That means they will drive themselves without a driver necessarily watching the road at all times.

The Internet of Things (IoT) is the thread that connects a wide variety of these market segments. Market research firm IHS predicts that growth in the number of connected devices in the IoT will continue unabated; swelling to 30 billion by 2020.

Impact on IC Sales

While sensors are indispensable, the IoT is also about communications and intelligence. It needs microcontrollers, power management ICs, as well as analog and mixed signal chips. The communication systems require RF and MEMS devices, and optoelectronic ICs. The data center for information processing demands more logic, memory and storage as well as silicon photonics.
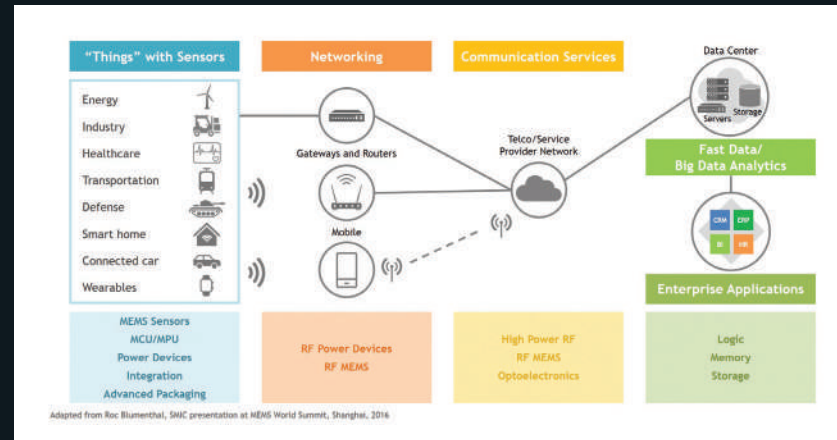

Figure 1: The IoT is not just about sensors. It conceals sensing, communications and computing ICs behind a seamless user experience.

In the future, a level 5 autonomous car, capable of full autonomy, will not just be dependent on advanced sensors, it will essentially be a self-aware server on wheels.

A recent McClean Report from IC Insights shows the underlying importance of ICs and their fabrication when it reveals IoT and automotive IC end-user markets to be the fastest growing areas over the 2017-2022 period with compound annual growth rates (CAGRs) of over 13 percent each. The two markets delivered $20.9 billion and $28 billion, respectively, in IC sales in just 2017.

A Marriage of Technologies

What holds devices together in the IoT and autonomous cars is not just sensing or machine-to-machine communication but a range of technologies. The march toward a networked society or Infrastructure of Things is indeed making strange bedfellows of a variety of fabrication techniques spanning materials and technology nodes.

In play are complementary metal oxide semiconductor (CMOS) processes for logic, bipolar CMOS (BiCMOS) or double-diffused MOS (DMOS) for power management ICs, DRAM for memory, 3D NAND for storage, wide bandgap devices such as silicon carbide (SiC), MOSFETs and gallium nitride (GaN) HEMTs Piezoelectric materials such as PZT, aluminum nitride (AlN) and scandium (Sc) doped AlN for RF filters and MEMS transducers as well as silicon germanium (SiGe) for RF ICs. If that were not enough, the devices in our key markets are currently manufactured with feature dimensions ranging from above 180nm down to below 28nm using older equipment handling 200mm wafers as well as newer machines for 300mm wafers.

Shared Challenges

Fabs face challenges in maintaining etch-depth and critical dimension (CD) control uniformity. Even the etched feature geometry or tilt can have a big impact on yield. These are all issues that must be dealt with at leading-edge technology nodes. For a 300 mm wafer, depending on die size, the outer 8 mm edge contains about 10 percent of the die, while the outer 2 mm edge has three percent of the die, making what happens at the edge an important influencer of overall productivity.

Edge discontinuities for material, temperature and electrical field during the etch process therefore have a significant impact on yield (figure 2). While at the leading edge the discontinuities of the wafer can affect the bulk of the performance of CMOS, the same issues of etch-depth control, CD control and geometric control in terms of tilting effect the latest generations of MEMS, power and analog devices. That is because the physics of what is happening on the wafer is the same. Therefore, if we address challenges associated with the physics at advanced technology nodes, we can take those lessons and apply them to other applications.
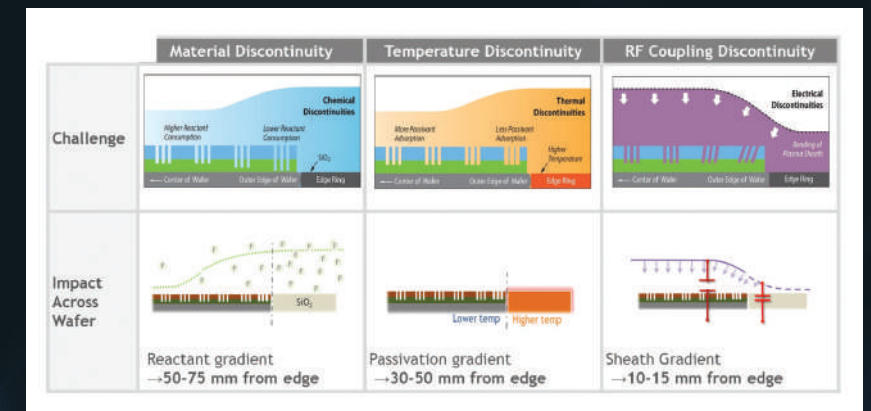
Figure 2: The physics of what is happening on the wafer remains the same, whether fabs handle 200 mm wafers or 300 mm wafers.

Advanced Solutions For 200mm

Apart from technological challenges, fabs face the challenge of building capacity at a cost appropriate point. Existing fabs can now address the IoT and automotive markets at a price point that is well below adding equipment at the most advanced technology nodes.

Take for instance, the Versys® Kiyo45™ conductor etch product, which takes the lessons from Lam's advanced 300mm experience and applies them to a 200mm wafer, resulting in increased repeatability, defect reduction, better wafer-to-wafer uniformity and higher throughput. Similarly, Lam's VECTOR® PECVD system, which has been gaining market share in key 300 mm plasma enhanced chemical vapor deposition (PECVD) applications, was not initially introduced as a 200 mm tool. However, its success at 300 mm resulted in a pull from our customer base to make it available at 200mm. The 200mm version has since become a bridging tool when introduced last year.

The payback from applying advanced technologies at 200 mm do not end there. Power, mixed-signal applications, MEMS, CMOS image sensors and even some packaging applications, such as system in package (SiP),

benefit from the introduction at 200mm of Lam's latest generation deep silicon etch (DSiE) process module that incorporates learning and features from Lam's 300 mm Versys® Kiyo45™ system and our Syndion® TSV etch tool (figure 3).

A Tested Upgrade Strategy

There are many thousand 200 mm Lam Alliance® tools in the field today with many being in excess of 10 years old. Yet, they are still heavily utilized and Lam's Reliant business continues to build both new and refurbished versions to support our customers. Lam's customers can also upgrade older Alliance® tools with the advanced control system and software architecture of Lam's 2300 platform. This Alliance® C upgrade also allows the tools to do things for which they weren't originally designed.
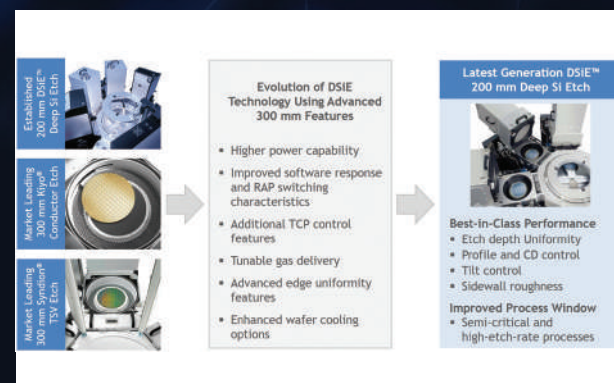

Figure 3: Pulling capabilities at 300 mm to apply them at 200 mm adds significant flexibility in a foundry environment.

Just by upgrading the control system architecture and the software, the Alliance C upgrade improves the timing and reproducibility on the tool. At one customer location, it resulted in a 46-percent standard deviation improvement in chamber-to-chamber CD with the process capability index (CPK) going up from 2.3 to 4.5.

The Alliance C upgrade also supports the addition of other upgrades such as throughput optimization (TPO), automatic preventive maintenance (AutoPM) and wet cleaning optimization (WCO). Whenever the process mix changes or a tool is repurposed, TPO software algorithms analyze and optimize the setup to improve tool performance. AutoPM runs a script to automate a large number of manual events and systematically and reproducibly bring the tool back online, thereby freeing

Figure 4: By providing upgrades to older tools, Lam Research significantly improves the benefit of the customer's assets.

up engineering resources to work on other systems. The WCO feature is software-guided cleaning guide that can be tailored to specific tool sets and provided in the customer's local language. At customer sites, it has reduced labor time and unscheduled cleans.

Meeting Future Application Demands

Lam Research has built 300 mm technological expertise and a comprehensive range of products that meet specific needs, including those for piezoelectric and wide band gap materials, and high-performance deep silicon etch applications. The rapid growth in IoT and automotive markets is, however, driving demand for expansion in 200 mm capacity, often at nodes greater than 28 nm.

Lam is now addressing these challenges with cost appropriate solutions by leveraging advances made for 300 mm equipment and applying them through hardware and software upgrades of existing 200 mm product lines.

SOURCE OF CONTENTS

Lam Research
www.lamresearch.com
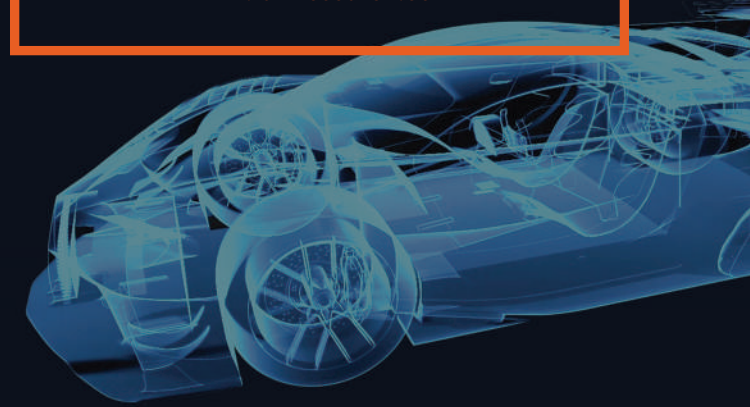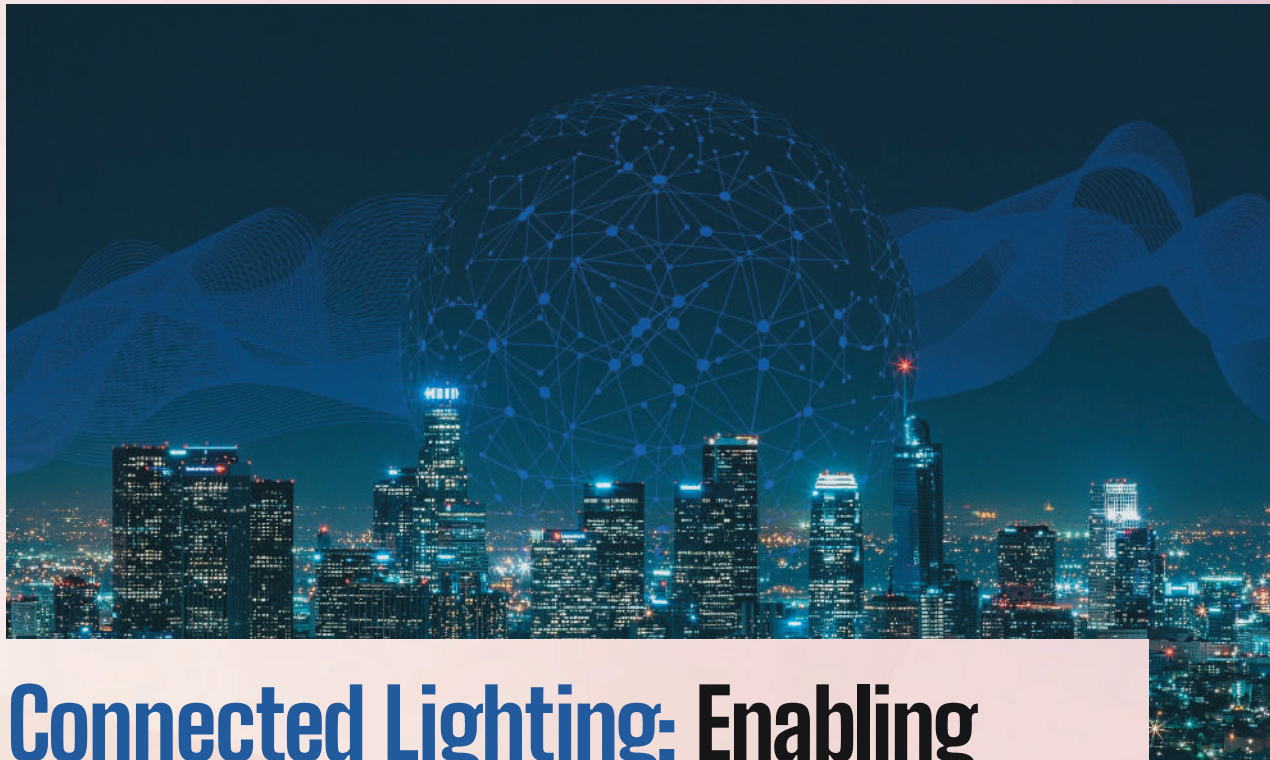
Connected Lighting: Enabling Intelligent Buildings and Leading the Way for IoT Energy Savings

Connected Lighting as a Means of Energy Saving

Residential, industrial and commercial lighting sectors accounts for 7% of the total energy consumed in the United States. Further, lighting and heating currently account for approximately 40% of energy consumption within industrial buildings. It's also one of the main reasons manufacturers within consumer and industrial markets are turning to connected lighting as a means of energy saving. If there is one area within the IoT that has the greatest potential for impact, it is connected lighting. As energy costs and concerns about environmental impact continue to rise, finding ways to apply technology and innovation to optimize lighting functionalities and reduce its power demands are becoming more important. Lighting also acts as a foundational network for smart sensors,

allowing industrial manufacturers to collect and store insights about the building's environment (temperature, humidity levels, occupancy, etc.).

While the implementation of LED light bulbs alone provides significant improvements in energy efficiency, connected or smart lighting also allows for further optimizations through automation and user control. One example is automatically adjusting lighting conditions during specific times of the day. This, coupled with a rise of new lighting services and features, have helped connected lighting become the area of highest potential growth within the smart homes and buildings segments.

Enhanced Levels of Control

While efficiency (and therefore cost management) is the primary driver for most connected lighting control, there are a number of other aspects that come into play when developing lighting applications within residential and industrial markets. Modularity is important, allowing lighting systems to be extended and segmented while the ability to control lighting with mobile devices permits

sophisticated interfaces to be deployed without the expense of a dedicated screen. With the enhanced levels of control available, new applications for lighting including uses in areas such as medical therapy and agriculture are emerging.

Basic lighting control starts with the ability to turn lighting on and off and extends to dimming and color control of LEDs. More complex systems support the full automation of lighting, energy management, intensity control and sensing and downlink connectivity.

Smart Home and Building Market

Connectivity is a key technology for controlled lighting systems, although there are multiple aspects of connectivity in this context. There is the connectivity between the lighting and the building management system (BMS) that provides the overall control, connectivity between the elements of the system and the connectivity used during the setup and commissioning of the system. Once the connectivity element has been implemented, a developer can add various sensors (temperature,

moisture, lighting levels). These local or cloud-based sensors add tremendous value to industrial applications as they can be used to report information to maintain or optimize systems.

The total smart home and building market will be worth about $200 billion USD by 2024. In addition to improving convenience, a key goal of these technologies is saving energy, which is driving rapid adoption of solid-state and connected lighting, occupancy monitoring and addition of sensors for predictive maintenance. ON Semiconductor is proud to provide solutions, sensors, connectivity options and platforms that aid in the advancements within this industry, shaping a more cost and energy efficient future.
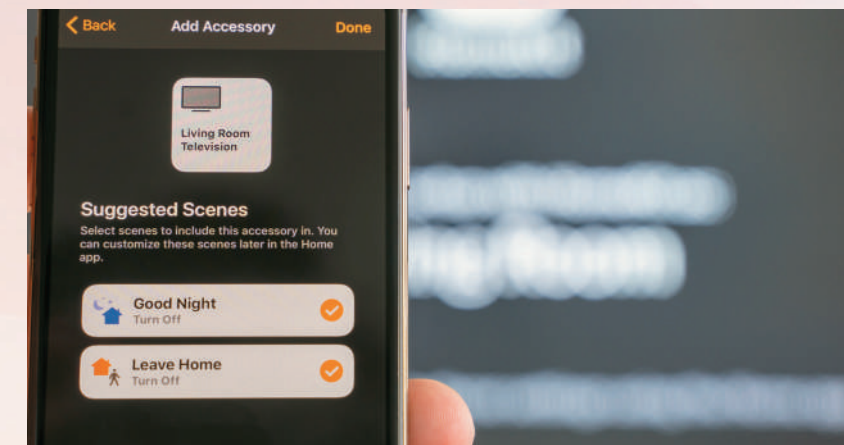
ABOUT THE AUTHOR

Bruno Damien
Managing Director
IoT, ON Semiconductor

ITAP 2020: Forging Ahead with Industry 4.0 in the New Normal

Helping manufacturers build a position of strength to operate in a COVID-safe world remains mission critical for this year's Industrial Transformation ASIA-PACIFIC – A HANNOVER MESSE EVENT (ITAP) from 20 to 22 October.

The COVID-19 situation has brought tremendous disruption to all industries and economies, forcing manufacturers and businesses to rethink their business strategies, relook business operations, recalibrate their resources and reskill their workforce. The event, in its 3rd edition, comes at a time when business transformation is pivotal to survival, scalability and sustainability.

Going Digital-First for Expanded Outreach and Growth Opportunities

With 'Forging Ahead with Industry 4.0 In the New Normal' as the driving theme, ITAP 2020 devises innovative ways in the virtual space for stakeholders to continue to START, SCALE and SUSTAIN their adoption of Industry 4.0 (I4.0) processes and solutions across industries and sectors. The three-day live virtual event and physical bolt-on activities will be delivered on a dedicated platform powered by AI recommendation engine, enabling personalized digital learning journeys with bite-size content and facilitating deeper community engagement and collaboration.

The event offers comprehensive content-rich learning avenues and themed activity zones for companies at various stages of business transformation to explore, collaborate and co-create solutions

to future-proof their businesses. Cohesively, it brings together a self-contained ecosystem and helps build a professional community for end-to-end engagements among I4.0 practitioners, technology & solution providers, industrial companies, component manufacturers, software companies, manufacturing solutions suppliers, service companies & consultancies and start-ups.

Heeding the Call for Bite-sized Learning

Since May, SingEx Exhibitions has held regular virtual sessions under the ITAP Academy: Connect series, comprising interactive web engagement sessions leading up to the main engagement in October, with all learning and networking engagements hosted on a dedicated virtual interactive platform. The series was created to respond to manufacturers' urgency to learn about and adopt Industry 4.0 solutions during this pandemic.

Organised by SingEx Exhibitions with international partner Deutsche Messe, ITAP receives strong support from the Singapore's government agencies such as Agency for Science, Technology, and Research (A*STAR), Economic Development Board Singapore (EDB), Enterprise Singapore (ESG), JTC Corporation (JTC), Singapore Skillsfuture (SSG), and Singapore Tourism Board (STB), along with their regional

counterparts as well as global industry leaders and key players in the region's business ecosystem. Register for your complimentary trade visitor pass today at *https://industrial-transformation.com/registration*

"Business survivability and transformation are the two biggest challenges our customers in the manufacturing industry are now facing. More than just about increasing productivity, it is about finding new opportunities to urgently accelerate and support their agility and responsiveness. In these trying times, establishing a hybrid platform will allow the community to easily collaborate on feasible solutions, optimise engagement and knowledge transfer, and find new growth opportunities"

MR. ALOYSIUS ARLANDO
Chief Executive Officer of SingEx Holdings Pte Ltd
Organiser of ITAP

"ITAP has always stood for innovation, inspiration and inclusivity. Going virtual provides the ideal platform for our community to be inspired by and learn about the latest products, collaborate on solutions, and connect with experts from around the world. It is also an important step towards paving the new normal for trade events when borders safely reopen."

DR. JOCHEN KÖCKLER
Chairman of the Managing Board of Deutsche Messe AG
International Partner for ITAP

SOURCE OF CONTENTS

SingEx Exhibitions Organiser of ITAP

FORGING AHEAD WITH INDUSTRY 4.0
In the new normal

20-22 OCTOBER 2020

Industrial Transformation ASIA-PACIFIC – A HANNOVER MESSE Event 2020 is poised to stage a first hybrid edition with a custom-built interactive virtual platform complimented with physical bolt-on activities from 20-22 October, to optimise engagement and knowledge transfer opportunities beyond physical event barriers of time, language and geography!

WHAT'S IN FOR YOU?

COMPREHENSIVE CONTENT-RICH LEARNING AVENUES
- Engaging Conference programme
- 24/7 available On-demand knowledgebase

DIGITAL LEARNING JOURNEY
- Variety of curated experiences to optimize knowledge transfer
- Virtual Gateway to Industry 4.0
- Collaboration and Robotics Lab

AI-POWERED DIGITAL PLATFORM THAT RECOMMENDS RELEVANT CONTENT
- Access to engaging product showcases with comprehensive online information and contact points
- Live product demonstrations

ENGAGE WITH VIRTUAL MEETINGS WITH DESIRED SOLUTION PROVIDERS
- Comprehensive suite of engagement tools that help you make the right connections

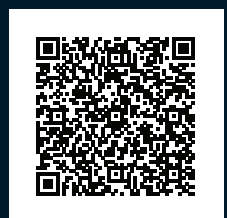**ONLINE BUSINESS MATCHING**
- Easy-to-use matching platform option for quality networking opportunities

PHYSICAL BOLT-ON
- Small group face-to-face engagement at physical venue for deeper knowledge transfer

REGISTER FOR YOUR COMPLIMENTARY TRADE VISITOR PASS TODAY

Organised By
SingEx

International Partner
Deutsche Messe

Industrial Transformation ASIA-PACIFIC

HANNOVER MESSE event

From Pulling Data to Pushing Borders

For organisations, the goal to globalise is common to the core of their long-term plan. In a survey conducted by the Singapore Business Federation found that in 2017, 4 of 5 Singapore firms expanded overseas or have overseas business activities. These activities generate information in the form of data, ranging from the estimated market size, actual number of products or services purchased to milestone numbers to predict trends.

The Data

"Data are just summaries of thousands of stories – tell a few of those stories to help make the data meaningful." – Chip & Dan Heath

Data collected is just a number until the number can be tagged to a name. Each name has a background and collectively, these background(s) can be pieced together to form an overall story. Organisations can then use these stories to paint the pictures they envision. Data sitting in the server occupies space and requires money to maintain. Getting the data to reveal what it represents will become a critical asset that plays a role in the organisation's story to bring more colour and clarity to the overall picture.

Looking at these assets as tradable commodities rather than just numbers provide for a more subjective representation as well as increases the overall contribution and worth it has to the organisation. This will help to expand the customer market group that organisations can target.

The Market

Solely relying on corporate direction and ignoring what the market data is representing, inhibits organisations from achieving optimal expansion. With digitalisation and blurring physical borders, this creates opportunities for organisations to identify consumer groups beyond the confines of the physical territories they operate in. By combining market data, understanding of consumer markets and the goal of the organisation, this can generate plans for additional business offerings.

Understanding the groups of consumers to target as well as method(s) to reach them is critical to every business.

Primary Market
Usually identified by organisations as the targeted consumer group which would be directly interested and take-up the offerings.

Organic Market
Group of consumers who will naturally gravitate towards the organisations over time.

Secondary Market
Second most important consumer group (from the primary consumer group) that the organisation will likely target and market to.

The following WeChat case study shows the shift in the different markets as well as how they use the data collected to make future business decisions.

Case study: WeChat

WeChat initially established itself as the go-to messaging and social media platform in China (primary market), has now expanded both in territories (secondary markets) as well as capabilities of the platform.

WalktheChat1 published an article in 2018 showing that WeChat commands 34% of total mobile traffic in China, this is compared to Facebook which commands 14.1% in North America. Considering the statistics, this indicates heavy usage of WeChat's offerings to consumers. The data can be further analysed on granular levels such as understanding age demographic or time spent on different functions on the platform. The data can then be used to better curate functions offered to consumers.

The migration of Chinese nationals into foreign countries have introduced the awareness and uptake of WeChat to the local communities. These new groups of consumers may not have been considered by WeChat but due to social migration, they now contribute to an expanded market WeChat can target (organic market creation). This shift in global consumer demand has allowed WeChat to be able to leverage on the different functions of WeChat to execute their operations across international borders such as through WeChat pay, creating secondary opportunities that were not originally part of the initial corporate plan.

Conclusion

Using data to predict and forecast consumer wants, can create new business opportunities. Organisations with the ability to analyse the data they have collected yet maintaining corporate direction, hold a key asset in industry positioning. The same set of data in the hands of different organisations, with their individual corporate directions and views, will yield different data analysis and interpretation results. Such competitive advantage of organisations cannot be easily replicated by competitors and can be beneficial in the long run through market dominance.

Understanding legacy data, combining with forward-looking planning and analysis, enable organisations to maintain their competitive advantage and push the border of globalisation. By repeating the steps of pushing boundaries and pivoting, organisations will be able to better position themselves to meet the ever-changing demands of the market.

References:

1. https://walkthechat.com/wechat-impact-report-2018-shows-impressive-social-impact/
2. http://www.academia.edu/8867191/Globalisation_in_Contemporary_Anime_An_Analysis_of_the_Multiple_Platform_Pok%C3%A9mon_Franchise
3. https://www.livemint.com/Sundayapp/Z7zHxltyWtFNzcoXPZAbjI/A-brief-history-of-Pokmon.html

ABOUT THE AUTHOR

Alrik Tan
IP Strategist
IPOS International

Semiconductor Tradewinds
JULY & AUGUST 2020

As we enter the second half of 2020, a year that started with so much promise, we are now faced with a dire global economic situation due to the COVID-19 pandemic with over 27 million confirmed cases and over 875,000 deaths worldwide. Although currently, the pandemic numbers are still growing daily in 213 affected countries and territories around the world, the world is also racing to expedite the vaccine development which optimistically may be available from early next year. Despite the global economic situation, the semiconductor segment has stayed so far relatively stable.

T he US, the world's largest economy, has over 6 million confirmed COVID-19 cases and saw its economy contracted by 33% in Q2, whilst Europe as a whole contracted almost 12%. On the bright side, the US economy is expected to rebound in Q3 by around 20%, but this still leaves the economy

shrunken from pre-pandemic levels. More locally, Singapore's GDP contracted almost 43% in Q2, though the manufacturing sector only shrank 0.7% in Q2. For the full year, the Singapore economy is expected to contract between 5-7% according to the Ministry of Trade & Industry. The only bright spot is China which is recovering from the pandemic and grew 3.2% in Q2. The upturn is expected to continue in the second half of 2020.

In the US, unemployment is slowly decreasing from a peak of over 14% in April to around 10% in July as the economy slowly opens up, but the pace of recovery has slowed. In the Eurozone, unemployment was 7.8% in July but this is expected to rise as further job cuts are expected in the coming months. Companies may downsize as furlough schemes aimed at keeping people employed start to wind down.

The Semiconductor Industry

Against this backdrop, the semiconductor industry has as a

whole fared quite well in the first half of 2020, and SIA is now expecting overall global semiconductor sales to grow 3.3% in 2020. Not all sectors will do well but NAND flash, DRAM, computer CPU, and embedded MPUs categories are all expected to grow. These segments will keep the overall growth positive despite IC Insights predicting that 25 out of 33 product categories will decline in 2020.
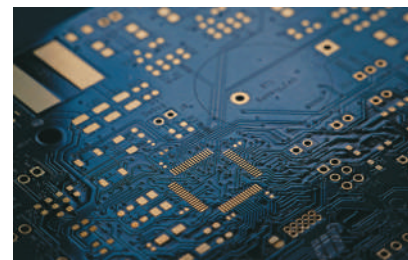
With the computer and data centre markets fueling the growth in the memory and CPU segments, two other major end markets for semiconductors are expected to decline in 2020. In the smartphone segment, the total number of smartphones shipped this year is expected to drop 9.5% in 2020 compared to 2019 with shipments expected to total 1.2 billion units according to market research company IDC. In the automotive sector, the number of automobiles sold is expected to drop 20% in 2020 to 59.6 million vehicles.

Despite the pandemic, the foundry market has continued to grow this year with most foundries and OSAT's reporting record monthly revenues in Q2. Overall foundry revenue saw a 20% year-on-year growth in Q2, and Q3 is expected to grow 14% according to Trendforce. TSMC is slowly extending its lead in the market and is expected to take almost 54% market share in Q3. Its 7nm line is running at maximum utilization and its 5nm volume is growing thanks to strong demand

from 5G infrastructure, CPU/GPU demand from high-performance computing applications and WFH arrangements. TSMC recently announced it will start volume production of 3nm technology in 2022 and will start 2nm development next year. Samsung is expected to hold the number 2 slot in Q3 with 17.4% market share, down 1.4%, and GlobalFoundries is the 3rd with 7% market share.

At the same time, as TSMC was announcing its 3nm process production release, Intel announced further delays on its 7nm technology and is now reported to be considering outsourcing its leading processors to foundries like TSMC and Samsung in the future. Both TSMC and Samsung are currently 2 years ahead of Intel as Intel continues to struggle to have the engineering expertise to keep up with its Asian competitors.

In the semiconductor equipment market, according to SEMI, global sales by original equipment manufacturers are projected to increase 6% to $63.2 billion in 2020, and sales are expected to further increase to $70 billion in 2021. In 2020, equipment spending growth is coming from the foundry and logic market, whilst DRAM capex spending is expected to decrease this year as DRAM manufacturers remain cautious despite the strong growth in sales.

Q2 results from the top semiconductor companies were mixed, but overall revenues grew 3.9% in Q2 compared to Q1. Memory companies (Samsung, SK Hynix, Micron and Kioxia) did very well due to the strong demand for data centres and computer memory. The non-memory companies did not fare so well in last quarter with Intel, Qualcomm, TI, Infineon, STM, NXP

all reporting lower revenue than Q1 (excluding acquisitions). Overall, the non-memory companies were down 1.4% in Q2. However, the outlook is not that bad with non-memory companies expecting better results in Q3, overall expecting 4% sequential revenue growth and excluding Intel, they are predicting 15% growth in Q3.

US-China Trade War Continues

Back in May, the US Department of Commerce imposed restrictions on companies selling to Huawei and its affiliates if they use US technology. Despite this ban, partly due to stockpiled chips and also by alternative sourcing, Huawei continued to grow, and in Q2, Huawei overtook Samsung to take top spot in sales of smartphones due to strong China sales.

Then in August, the US DoC further tightened sanctions. A further 38 Huawei affiliates were added to the entity list. Foreign semiconductor companies were restricted from selling chips developed or produced using US software or technology to Huawei, without first obtaining a license to do so. This is designed to prevent Huawei from going through third parties to purchase items and effectively extends the ban to all chip designers, such as Taiwan's MediaTek.

The US has also been putting pressure on its allies to persuade them to ban Huawei equipment

from their 5G networks. So far, countries including the UK, France, Japan, Australia and India have all announced they will not allow Huawei equipment in their 5G networks.

In response to the US using semiconductors as one of the key battlegrounds in the trade war, China is trying to further accelerate its semiconductor manufacturing capability as part of its "Made in China 2025" plan. In August, it announced new tax incentives for domestic semiconductor players. Under the new rules, qualifying companies will be exempt from corporate income tax for up to 10 years if they use 28nm or below technologies, and 5 years if they use 65nm ~ 28nm technologies. In addition, China is reported to plan a further sweeping suite of measures to bolster research, education and financing for the industry. These measures have been added to a draft of China's 14th five-year plan, which will be presented to the nation's top leaders in October 2020. Despite all these measures, it is estimated that China will still import US$300billion worth of semiconductors in 2020 from the US and elsewhere.

Mergers and Acquisitions

Here is a summary of the major acquisitions and mergers that happened in the last 2 months.

Broadcom sold its wireless IoT business to Synaptics for approx US$250 million. This is the 2nd time Broadcom has sold this division. In 2016, it sold its IoT wireless division to Cypress Semiconductor but retained the right to develop Wi-Fi, Bluetooth, and other wireless capabilities to support its customers in consumer electronics markets.

Austrian sensor company AMS received the final regulatory approval from Europe for its acquisition of German lighting company Osram and completed the acquisition in July 2020.

STMicrolectronics announced 2 separate acquisitions, one to acquire French ultra-wideband technology company BeSpoon and the other to buy Canadian cellular IoT connectivity company Riot Micro.

Softbank has announced it is considering the sale or IPO of Arm Holdings, which it bought 4 years ago. Arm supplies silicon IP which is at the heart of most systems on chips used by major electronics companies and used in everything from smartphones to IoT products. As such, any acquisition will come under extensive regulatory scrutiny. With a selling price of around US$40 billion, quite a few major semiconductor companies have been rumoured to be interested but the favourite so far is Nvidia.

Optoelectronic component manufacturer II-VI announced 2 acquisitions. It has entered into a definitive agreement to acquire all outstanding shares of Swedish SiC epi wafer manufacturer Ascatron. In another deal, II-VI will acquire all outstanding interests of US ion implant services company INNOViON. Both transactions are scheduled to close by the end of 2020.

Fab Opening and Closures

Dutch lighting company Signify will close its production facility in Kansas US, which makes conventional lighting products, and move production to its facilities in Poland and India.

In Taiwan, there were quite a few announcements. Backend assembly and test provider ASE said it would invest US$880 million to build a new Fab, K13, in Kaohsiung to expand advanced testing and packaging capacity for 5G-related chips.

Foundry TSMC is also expanding capacity as it announced it has bought a factory in the Southern Taiwan Science Park in Tainan for US$29 million. It is TSMC's second purchase of a factory complex in the science park in August as it prepares to expand production capacity. In addition, TSMC has said it plans to open a new cutting-edge research-and-development centre in Hsinchu next year to develop 2nm technology, and is also seeking to acquire land adjacent to the new R&D centre to build a production fab for 2-nanometer chips.

Taiwan foundry Powerchip said it planned to build a new 12 inch Fab in Miaoli County in Taiwan as strong demand for display drivers have boosted utilisation in their factories to 100%. The company plans to start building it in Q2 next year, and will have an initial capacity of 15,000 wfrs per month.

In China, the news is not so good as construction at Wuhan Hongxin Semiconductor, a new logic foundry in Dongxihu started 2 years ago, has been halted due to financial difficulties. HSMC originally intended to build a 14nm Fab with a capacity of 30000 wpm. This is the 4th Fab project in China that has been stopped recently.

Locally in Singapore, Vanguard plans to spend US$64 millon in its newly acquired Singapore Fab to increase capacity by 33% to 40,000 8" wfrs/month to support the strong customer demand.

Outlook

It seems that the semiconductor segment will continue to do well in Q3 and hopefully, this trend will continue through into Q4 driven by demand for the Christmas and Chinese New Year festivities. However, the global economic situation and outlook cannot be ignored. There are a few reports of inventory levels building up, so any optimism must be tempered with a sense of caution until a vaccine is readily available.

ABOUT THE AUTHOR

Mark Dyson
Head of Global Subcon Manufacturing of Osram Optoelectronics

Making more out of less – Infineon to become carbon-neutral company by 2030

Our Semiconductors enable systems that make our everyday lives more comfortable and at the same time minimize impacts on our environment. At Infineon, we take on social responsibility. We are working towards carbon neutrality by 2030. With our goal to become carbon-neutral, we are making a pledge by which others outside the company can measure us. At the same time, it is a motivation for all of us in the company to do all we can to continue minimizing our own footprint.

50 Years Infineon Singapore

Infineon

www.infineon.com

Automated, Optimized Solution
Enables Semiconductor Customers To Focus On Core Business

DHL Supply Chain's Advanced Regional Center (ARC) opened in Singapore in 2016. This state-of-the-art 90,000 sqm facility features a multi-customer automation system which uses advanced robotics, and bespoke solutions that cater for specific industry needs.

It enables DHL customers to enjoy the benefits of automated solutions without the need for significant capital investment.

DHL runs the regional distribution centers for two global integrated device manufacturers at the ARC. DHL looked to deliver for them, and other semiconductor manufacturers, a showcase, automated system that would enable productivity improvements while delivering high quality services.

Challenge

The semiconductor customers required a scalable and flexible supply chain solution to manage significant changes in volumes during peak season.

This included a flexible pool of trained employees who could meet the changing operational needs.

Due to the nature of the semiconductor business, the customers also required an extremely fast time turnaround, from stock arriving to it becoming ready and available to ship.

The operations team was challenged to recruit and train qualified employees fast enough to meet their needs. Due to the complexity of the work, employee retention was also difficult.

With customers achieving year-on-year organic growth of 10–15%, they wanted an innovative solution that could optimize their storage and improve productivity.

Solution

DHL proposed an innovative, multi-user automated system – a solution which was a first for the industry. In talking to potential suppliers, DHL looked for a system that had extremely high throughput and could utilise the high 13M clearance at the ARC. It also needed to be compact in footprint and possess the flexibility to handle the requirements of many different customers.

After an extensive review by automation experts at DHL, the Dematic Multishuttle system was selected as the one that best met requirements. This next-generation shuttle system is designed to store, buffer and sequence products between bulk stock and functions such as picking and order assembly. It has been designed to dramatically increase speed, accuracy and throughput.

Working in close collaboration with Dematic, the automation team designed the process and the system. This involved close consultation with operations, IT teams and customers to ensure that their needs would be met, while making it generic enough to accommodate new customers.

Top-tier warehousing management systems from JDA and SAP were chosen for its functionalities such as volumetric-driven inventory control. The shuttle system has been designed with sustainability and energy efficiency in mind, and power is only routed to the shuttles when it is active. It is expected to have a lifespan of between 15 and 20 years.

Through the Resourcing Center, DHL shortened the recruitment process to 4 days and introduced onsite assessment and simulation exercises to more accurately assess candidates.

Benefits

The new system exceeded initial productivity assumptions. Its increased speed of picking and putaway has resulted in a faster turnaround time for customers and from order drop to completed pick now takes six minutes per order.

The solution has proven to be extremely resilient, with little or no downtime and operates 24 x 7 x 365. Even the minimal maintenance that is required can be completed while the unit is still operational.

Inventory accuracy of the system has been measured at 99.999% which has removed the need for extensive cycle counting. The number of people required to operate the system is significantly lower than in a conventional facility, a benefit in a country where there is low unemployment and supply chain talent can be hard to recruit.

This highly automated and optimized solution allows DHL's semiconductor clients to focus on their core business.

More importantly, DHL recruits, trains and retains a flexible pool of highly skilled supply chain specialists who could scale to the customers' seasonal volumes and meet their stringent quality standards.

DHL Advanced Regional Center

Multi-user automation solution

"We started our automation journey in 2013. In collaboration with our customer, we pioneered Asia's first automated distribution center featuring the AutoStore. In 2016, we officially opened ARC which houses our multi-user automation system. These automation solutions are great for Singapore where labour and land costs are high.

While investing in technology and innovation is important, the key to our world-class operations and performance is our strong people approach. We have a team of 1,400 supply chain specialists who are trained and passionate to deliver on our KPIs and continuously improve our operations."

Eunis Hew,
Country Head of Operations,
DHL Supply Chain Singapore

Scan for more details
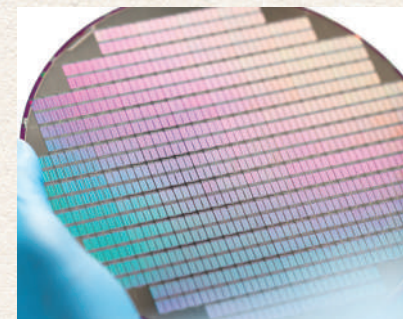

SOURCE OF CONTENTS

Chips for America Act & American Foundries Act Introduced in U.S to Strengthen Semiconductor Manufacturing

In June 2020, a bipartisan group of U.S. lawmakers introduced the Creating Helpful Incentives to Produce Semiconductors for America Act (CHIPS for America Act) and American Foundries Act to invest tens of billions of dollars in semiconductor manufacturing incentives and research initiatives over the next 5-10 years to strengthen and sustain American leadership in chip technology. Provisions from these bills were included in the Senate and House versions of the National Defense Authorization Act (NDAA), which were passed by their respective Chambers in July and now await action by a conference committee to merge them into final legislation.

Incentivize New Domestic Semiconductor Manufacturing Facilities

"Semiconductors were invented in America and U.S. companies still lead the world in chip technology today, but as a result of substantial government investments from global competitors, the U.S today accounts for only 12 percent of global semiconductor manufacturing capacity," said Keith Jackson, President, CEO, and Director of ON Semiconductor and 2020

Semiconductor Industry Association (SIA) Chair. "The CHIPS for America Act would help our country rise to this challenge, invest in semiconductor manufacturing and research, and remain the world leader in chip technology, which is strategically important to our economy and national security. We applaud the bipartisan group of leaders in Congress for introducing this bill and urge Congress to pass bipartisan legislation that strengthens U.S. semiconductor manufacturing and research."

The U.S. currently maintains a stable chip manufacturing footprint, but the trend lines are concerning. There are commercial fabs in 18 states, and semiconductors rank as our nation's fifth-largest export. However, significant semiconductor manufacturing incentives have been put in place by other countries, and U.S. semiconductor manufacturing growth lags behind these countries due largely to a lack of federal incentives.

The CHIPS for America Act includes a range of federal investments to advance U.S. semiconductor manufacturing, including $10 billion for a new federal grant program that would incentivize new domestic semiconductor manufacturing facilities. The bill also includes a

refundable investment tax credit for the purchase of new semiconductor manufacturing equipment and other facility investments.

Advancing R&D to Drive Chip Technology Breakthroughs

Research is critical to advancing semiconductor innovation in the U.S. American semiconductor design and manufacturing companies invest approximately one-fifth of revenue in R&D, almost $40 billion in 2019, representing the second-highest rate of research investment of any industry. Federal government investment in semiconductor research, however, is only a small fraction of total semiconductor R&D in the U.S. and has been relatively flat as a share of GDP for many years. Meanwhile, China and others are increasing their government research investments.

The CHIPS for America Act would make significant federal investments at the Department of Defense, the National Science Foundation, and the Department of Energy to promote semiconductor

research and drive chip technology breakthroughs. The bill would establish a National Semiconductor Technology Center to conduct research and prototyping of advanced chips, as well as create a center on advanced semiconductor packaging.

American Foundries Act

Another bipartisan bill, the American Foundries Act, which includes a $15 billion federal grant program that would incentivize new domestic semiconductor manufacturing and R&D facilities, has also been introduced in the Senate in late June 2020. Provisions from the two bills were included as amendments in the Senate and House versions of the National Defense Authorization Act (NDAA). It now awaits action by a conference committee to merge them into final legislation which will be a process that could take through the end of the year.

"As global competitors invest big to attract advanced semiconductor manufacturing to their shores, the U.S. must get in the game and make our country a more competitive place to produce this strategically important technology," said John Neuffer, President and CEO of the Semiconductor Industry Association.
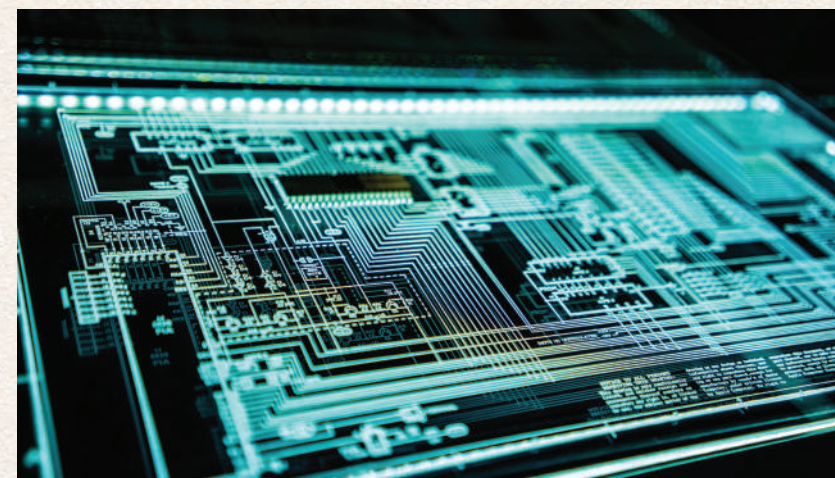
SOURCE OF CONTENTS

Semiconductor Industry Association
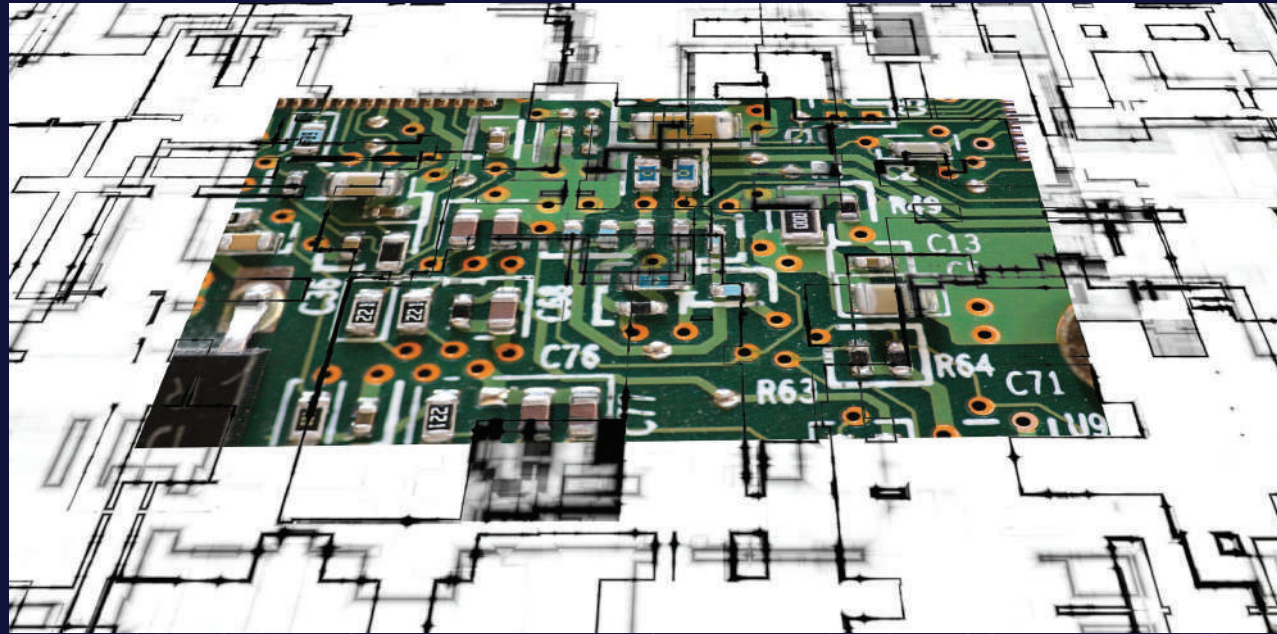
Game-Changing Chips

From gaming and cloud computing to mobile banking, the chip is core to the technologies you reach for every day – and many chips and chip technologies, including some of the latest game-changers, are developed or made in Singapore.

Infineon's REAL3 : Small But Mighty

We have come to expect phones to deliver reliable face authentication and stunning photos, yet reliable 3D image data is only made possible by the image sensors behind them.

Infineon Technologies AG, which has its regional headquarters and Design Centre here, is collaborating with pmdtechnologies ag to develop REAL3™, the world's smallest and most powerful 3D image sensor. Measuring in at just 4.4 x 5.1 mm, it can be incorporated into the smallest of devices to support critical 3D image matches, like when facial recognition is used to complete bank transactions and unlock devices. Cooler applications include enhanced autofocus, and that dreamy bokeh-effect in Instaworthy pictures . It can even support authentic augmented reality experiences.

Micron: Not a Flash in The Pan

Opened last year, Chipmaker Micron's cutting-edge plant in Singapore has as its focus the latest-generation 3D NAND flash memory chips, used in everything from smartphones and cameras to high-end computers in data centres. Singapore is also home to Micron's NAND Center of Excellence, where it conducts everything from R&D to assembly and testing. It's a long way from when Toshiba invented flash memory in the 1980s and displaced hard disks and floppy disks as a way to store information. Today, Micron's technology continues to break new ground in speed and features, including ever-increasing storage capacity.

NVIDIA: Game-Changing Graphics Card

For Minecraft fans, the game might have reached its pinnacle, but some of the latest graphics cards from Nvidia Corporation just keep making things better. The Made-in-Singapore Nvidia GeForce RTX 20-series uses an artificial intelligence processor to boost frame rates and increase the resolutions gamers can play at, stimulating light in games more realistically, for instance, ensuring reflections appear on water surfaces and that shadows fall where they should. Game on!

AMS 3460: Revolutionising Noise-Cancellation

Sensor solutions company ams, which uses Singapore as its core R&D and manufacturing centre, has been revolutionising the world of sound. Its chips have amped up noise cancelling power - whether you're using loose- or closed fitting earbuds. Its as3460 sensor combines two microphones that listen to your environment while an algorithm is used to figure out if you're in a noisy club or an airplane, and automatically adjust its noise filter to suit. The as3460's Digital Augmented Hearing engine could eventually be used for personal health monitoring, and even treating the symptoms of tinnitus.

Semiconductor Industry Communication Campaign

Over the last 50 years, semiconductors have underpinned Singapore's success. Today, especially during the COVID-19 pandemic, the semiconductor industry powers our global digital infrastructure and underpins vital sectors of the economy. Semiconductors are also essential components of the technologies that control and enable essential infrastructure and life-critical equipment such as health care and medical devices, water systems and the energy grid, transportation and communication networks, and the financial system.

Singapore Semiconductor Industry Association (SSIA) and the Economic Development Board (EDB) will soon embark on a campaign to tell the untold stories of the microchip and the resilience of the industry, to attract passionate, driven and skilled school leavers and professionals into the sector.

If you have any stories or know someone worthy of being to be highlighted in the campaign, drop us an email at secretariat@ssia. org.sg, telling us the details or who they are, and their contact information, if possible.

SOURCE OF CONTENTS

Websites of Infineon, Micron, NVIDIA and AMS

The Rise of Compact High Performance GaN-on-GaN
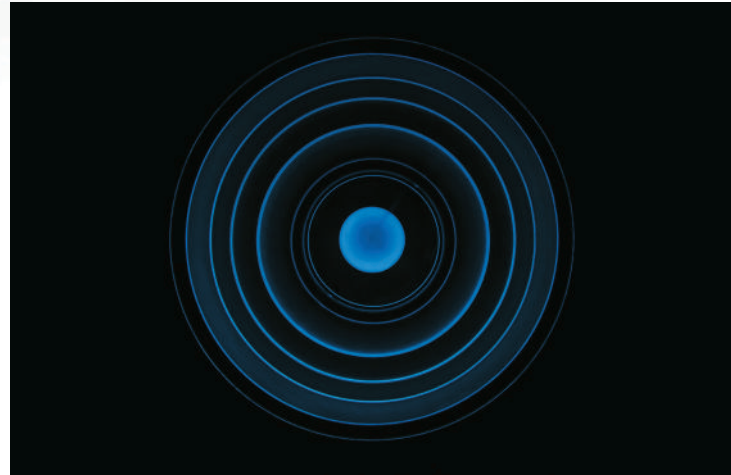
Solid-State Radiation Sensors

Gallium Nitride (GaN) with its large bandgap, high electron saturation velocity, and critical electric field has found many applications in illumination, high frequency and high-power devices. Recently, researchers have started exploring radiation sensing as a probable application for GaN devices on the virtue of the high Displacement Energy (ED) of GaN (20 eV) which is twice of any other popular semiconductors such as GaAs and Si. GaN-based radiation sensors can improve the functioning of the detector by improving the lifetime of the detector, operational temperature range and in detection of higher energies. These advantages open new avenues for applications in high energy particle research, imaging tools in medicine, nuclear reactors, arial radiation detection and surveillance. In short, the development of GaN radiation sensors could transform the whole solid-state radiation sensors industry.

Development of GaN Radiation Sensors

In view of the requirement of solid-state radiation sensors, researchers have explored Si and GaAs as possible candidates which have demonstrated high energy detection at low voltages making them ideal for portable α-particle detectors. Although commercially available solid-state detectors are able to detect high energies, they have a low lifetime and their reliability at high temperatures is questionable. Recently developed GaN-based α-particle detectors have been explored to overcome both these disadvantages due to its higher ED. Up till now, different research groups have successfully fabricated GaN Schottky Barrier Diodes (SBD) and tested them in alpha particle detection. While SBDs with thin epitaxial layers (<12 μm) could only detect low energy alpha particles (<4.5 MeV) at −120 V, SBDs on bulk GaN substrate required very high voltage (−550V) to detect higher energies (5.48 MeV). However, both bulk GaN SBDs and SBDs with thin epitaxial layers show extremely poor performance at low voltages. The poor performance of GaN-based radiation detector is due to high Threading Dislocation Density (TDD) and limited Depletion Width (DW). While high TDD increases leakage current (IR) thus reducing the sensitivity of the detector, thin DW restricts the maximum energy which can be detected by a GaN detector.

Mg-compensated GaN SBD

In Nanyang Technological University in Singapore, to improve the portability of GaN-based solid state α-particle detectors, a research team lead by Prof. Ng Geok Ing in collaboration with Prof. Hiroshi Amano from Nagoya University in Japan and Dr. John Kennedy from GNSS in New Zealand have worked on reducing the voltage requirement by employing a first of its kind Mg-compensated GaN SBD as a detector. The use of this novel compensated structure has enabled the formation of a thick DW even at low voltages. The thick DW has helped improve the reverse bias electrical characterization of the diodes by reducing IR by 6 orders of magnitude and improving the reverse breakdown voltage to −2400 V [1] which is the highest reported breakdown voltage on a vertical GaN SBD. Apart from the improvements in electrical characterization, the devices have also helped detect α-particles of 5.48 MeV with 65% charge collection efficiency (CCE) (at −20 V) which is 30% higher than previously reported value [2]. Compensated GaN-based detectors were also able to detect α-particle radiation with 100% CCE at −300 V which is 250 V lower than previous reports. A detailed explanation on the development and working of these novel GaN-based α-particle detectors can be obtained in a review paper [3]. These promising results have demonstrated great potential of GaN-based α-particle detectors in radiation sensing applications.

References:

1. Sandupatla, A.; Arulkumaran, S.; Ng, G.I.; Ranjan, K.; Deki, M.; Nitta, S.; Honda, Y.; Amano, H. GaN drift-layer thickness effects in vertical Schottky barrier diodes on free-standing HVPE GaN substrates. AIP Adv., vol. 9, p. 045007, 2019.
2. A. Sandupatla, S. Arulkumaran, K. Ranjan, N. G. Ing, P. Murmu, J. Kennedy, S. Nitta, Y. Honda, M. Deki and a. H. Amano, "Low voltage high-energy α-particle detectors by GaN-on-GaN Schottky Diodes with record-high charge collection efficiency," Sensors, vol. 19, no. 23, p. 5107, 2019.
3. Sandupatla, A., Arulkumaran, S., Geok, N., Nitta, S., Kennedy, J., & Amano, H. (2020). Vertical GaN-on-GaN Schottky Diodes as α-Particle Radiation Sensors. Micromachines, vol. 11, no. 5, p. 519, 2020.
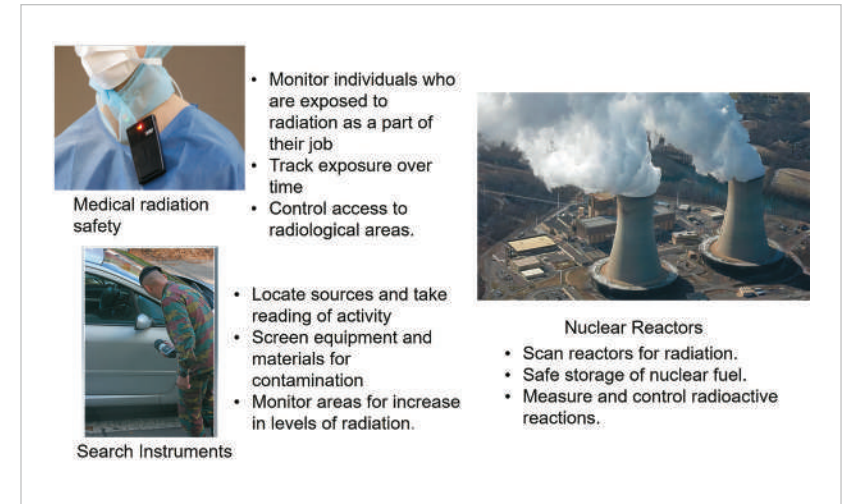

Figure 1: Applications of α-particle detectors
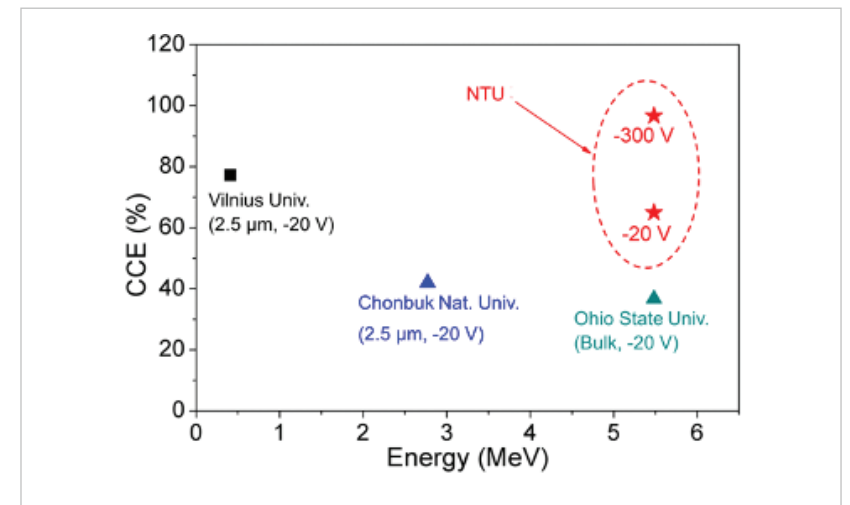
Figure 2: Benchmarking of extracted CCE of our detectors with epitaxial-grown GaN detectors (squares) and bulk GaN detectors (triangles) at low voltages

ABOUT THE AUTHORS

Prof. Ng Geok Ing
School of Electrical and Electronic Engineering, Nanyang Technological University

Abhinay Sandupatla
School of Electrical and Electronic Engineering, Nanyang Technological University

Dr. Subramaniam Arulkumaran
Temasek Laboratories@NTU, Nanyang Technological University

Reimagine Your Business With IP

"Adapt" "Transform" "Innovate" "Digitalise"

SMEs must _____ to be competitive in our new economy. Fill in the blank with any of the words above and you get a headline that is too often seen in the news. Much ink has been spilt by the media on how business models and paradigms must change in order for companies to remain relevant in the face of rapid technological advancements and increasing global connectivity. Much less has been written on how exactly SMEs can transform their business.

In this article, I will share one way for SMEs to transform using its existing assets, simply by reimagining the business with intellectual property (IP).

Let us take the example of an SME that manufactures and sells portable air filtration units for the consumer market. Using experience gained from manufacturing these air filtration units, the SME developed a new material and microstructure for a filtration membrane that is more efficient and effective than those available in the market. Traditionally, the SME can monetise its invention in two ways:

1. Manufacture and deploy the filtration membrane in its own air filtration units.
2. Manufacture and sell the filtration membrane as a standalone product.

The new filtration membrane is well-received. However, the SME lacked the financial capital and resources to scale up manufacturing to meet additional demand and did not have the logistics networks in place to ship the products to new markets. In the end, the SME did not manage to expand beyond its existing markets. This dilemma will not be unfamiliar to many SMEs, and it limits the return that SMEs are able to reap from its investment in R&D.

Leveraging IP Licensing to Grow the Business

However, what if we reimagine the business as one that deals with IP, rather than one that sells physical products? What if we reimagine the filtration membrane not as a physical product, but as a composite of different IPs?

In this reimagined business, new monetisation opportunities are unlocked. In addition to deploying or selling the filtration membrane, the company can now license the technology (and the IP rights protecting the technology) to third parties in return for royalties, creating an entirely new revenue stream. For example, the company could:

1. License the technology to companies that manufacture industrial air filters.
2. License the filter material to companies for new uses in other products (e.g., water filters).
3. License the portable air filter (all the IP comprised in the new filter membrane and the portable air filter) to a third party for manufacture and sale in new markets the company has not entered.

In all the scenarios above, the IP is licensed to third parties that do not compete directly with the company's core consumer business. The company also enjoys several benefits with this reimagined business model, including:

Benefits of a Licensing Model

Low variable cost to implement

One great feature of IP is that it scales easily. Unlike a physical product where additional manufacturing costs are incurred on a per unit basis, there is no additional cost for a company to license its IP to a third party to manufacture additional units. This is analogous to the software business; the cost to license 100 or 1000 copies of a software will be quite similar if not the same. And indeed, software itself is IP protected by copyright.

Enter new industries and risk diversification

By licensing its technology for use in new applications, the company leverages its licensees' strengths to enter industries it would not have been able to enter on its own, and diversifies business risk across different industries.

Expansion into new geographical markets

The company can leverage on its licensees' logistics and sales networks, cost advantages, as well as local knowledge to sell its products in new geographical markets. If the products are sold under the company's brand (i.e. brand is also licensed), the company further benefits from building brand recognition in these new markets.

If this reimagined business proves successful, the company may even decide to shift away from manufacturing its own products to focus on R&D and IP licensing. This is the model of ARM Holdings, which is valued at more than USD$30Bn and dominates 90% of the mobile application processors market2 by licensing its innovative chip technologies.

Support on Engaging IP Services

That said, there are costs to implementing a licensing business, such as the cost to market the company's IP and to enter into licensing negotiations with potential licensees. The company's IP would also need to be strong enough to attract licensees. IP protection, exploitation and negotiation strategies can quickly turn complex, and companies embarking on licensing for the first time may require external assistance to navigate these issues.

The good news is that help is at hand. There are many IP service providers in the market that can support companies on this journey to reimagine its business, and government support is available for engaging these services.

The licensing model may not be suitable for your company, but this is just one way amongst many to reimagine your business and generate greater returns using your IP.

If you are interested in finding out more about how intangible assets can help your business to take advantage of new opportunities, you can book a complimentary 45-min chat with IPOS International's strategists by emailing _reuben.lim@iposinternational.com_. You can also download IPOS International's complimentary business guides on IP management issues to help you realise tangible value from your intangible assets, from _https://iposinternational.com/business-guides/_

ABOUT THE AUTHOR

Fu Zhikang
IP Strategist
IPOS International

Travel photo taken in Western Australia

A Chat with the SSIA Secretariat Team Member

The Story of Rebecca's Career Journey

Can you tell us about your career journey?

I was initially interested in working with the National Heritage Board as a museum conservator, but I pivoted into events instead. I had done temp work for SMU and the Singapore Academy of Law in events and I found the job to be interesting and exciting because you always got to meet new people, and most events catered free food, which is always a great job benefit! After running events for the legal industry for a few years,

I was looking for opportunities to run events for bigger industries, and SSIA gave me the chance to do just that and more.

What are the similarities and differences between your previous roles and the role in a semiconductor trade association?

The biggest difference in roles would be for handling the PCP for Electronics. Instead of managing an event, which usually runs for only 1 day, PCP is an on-going programme

and with many moving parts. PCP also allows me to interact more with representatives from our member companies, getting to understand their manpower needs.

Photo taken when Rebecca worked at the Malay Heritage Centre in Kapong Gelam

### How do you know about SSIA and why do you choose to join the Association?

I find it rewarding to join SSIA because the Association helps companies to grow their business and provide job opportunities for the community.

Tell us something about your role in SSIA?

My role as senior project executive is to ensure events run as executed, and as a programme manager for PCP, I help to match companies with job seekers and process claims for salary disbursements.

How do you see the changes in your work after the COVID-19 crisis?

Since we started working from home, working hours have become more flexible, which has both good and bad points, as I am sure many other people have experience. Because we conduct so many video calls as part of the new normal, I also had to change the set up in my study so that I can have a blank wall behind me for a clean background in my calls. We now arrange for most documents to be sent via email rather than by courier. However, I still find myself writing physical notes and tasks lists, and just like with physical paperwork, I take some time each week to organise and file away the digital files that I receive.
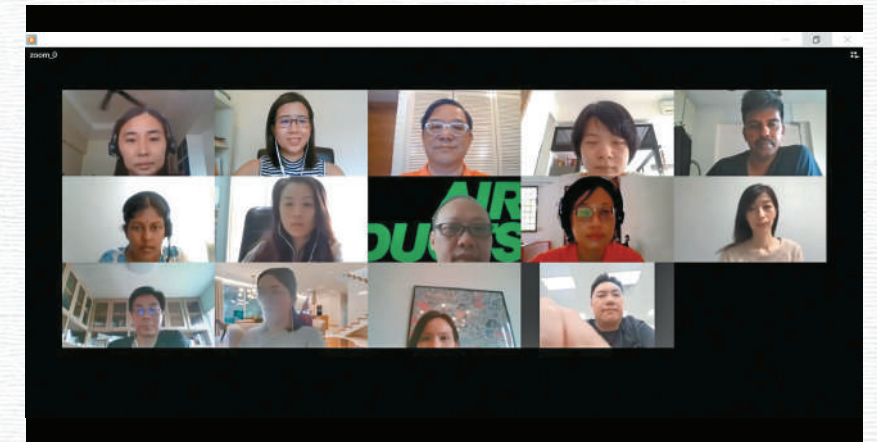
Rebecca hosting a virtual SSIA industry relevant course

Let's talk about something personal. Can you share with us a bit more about your hobby (or your volunteering roles in community)?

I would call myself a 'Jill of all hobbies, master of none', I enjoy trying out new hobbies, particularly creative and artistic hobbies during my free time such as scrapbooking/card-making and nail art. I enjoy making things by hand because there is a personal touch that goes into each piece that makes it more unique. Before Covid-19, I also played ultimate frisbee with friends on the weekend to work out and stay healthy.

Nail art done by Rebecca when Avengers 2 came out

Making Sense of Data

Professor Zhang Louxin shares how NUS' MSc in Data Science and Machine Learning will help students gain an edge in our data-driven world

In the span of a few decades, computers have gone from taking up the space of entire rooms to fitting comfortably in our pockets. This remarkable progress has resulted in several technological advancements, including quicker and smarter computing processes and diverse applications of artificial intelligence (AI) and machine learning in daily life. With AI ever-present now, from smartphones to self-driving cars, making sense of what goes behind the technology is only going to be more important sooner rather than later.

What is this course about?

MSc in Data Science and Machine Learning is a self-funded inter-disciplinary graduate degree programme, and the candidature is one to two years. It will help to meet the growing demand for big data professionals in all industries by transforming graduates in quantitative science into data science and analytics practitioners.

Professor Zhang Louxin

Whom is this course for?

The course is designed to nurture the next generation of leaders in data science. It is for learners who wish to learn the advanced topics and skills in data science and machine learning necessary for careers as data scientists and machine learning or AI specialists in several sectors – government, retail and logistics, computer vision, healthcare and finance.

How important have data science and machine learning become in recent years?

We are now facing a massive explosion in the amount of data generated and retained by organisations, the government, and even individuals like you and me. In the future economy that is heavily reliant and driven by the adoption of new technologies and big data, the ability to analyse and process data has become a critical skill set. Data scientists will be able to make sense out of data and use it to steer business decisions.

What can students look forward to?

The programme offers upgrading opportunities for those who wish to equip themselves with data science and machine learning knowledge and data analytics skills. It will provide students with a solid foundation in these two topics, and computing skills in data analytics. This is achieved by integrating statistics, maths and computing, as well as machine learning and AI.

What will students gain after graduating from this course?

They will be well-poised to harness the power of data to solve problems and deliver meaningful outcomes for their organisation.
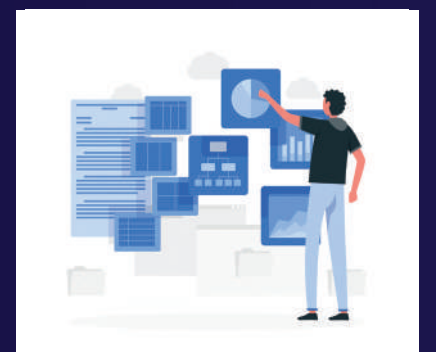
For more information on the MSc in Data Science and Machine Learning, please contact *pgc@nus.edu.sg.*

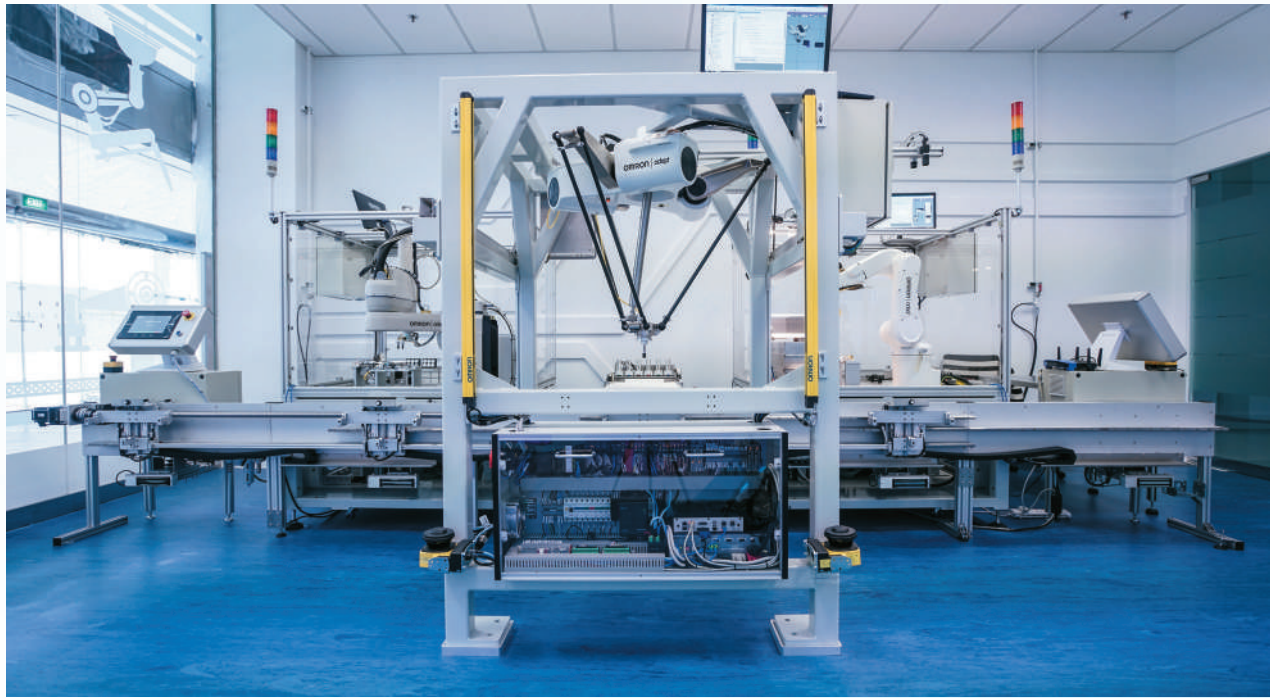**MASTER OF SCIENCE IN DATA SCIENCE AND MACHINE LEARNING**

National University of Singapore, Faculty of Science

- **Full-time:**
  One to two years
- **Part-time:**
  Two to four years
- **Next Admissions Intake:**
  Aug 2021
- **Application Window:**
  15 Oct 2020 – 31 Jan 2021
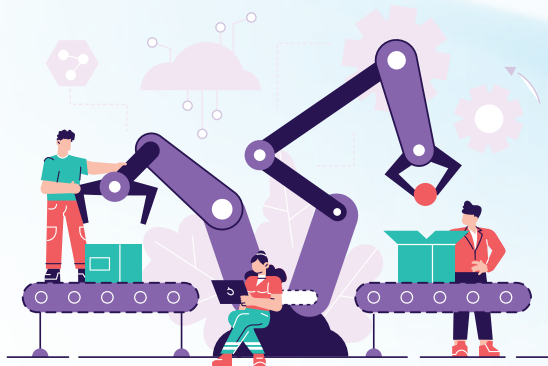- **Contact:**
  pgc@nus.edu.sg

SOURCE OF CONTENTS

National University of Singapore

Temasek Polytechnic Advanced Manufacturing Centre

An End-to-End 'Live' Smart Factory for a Future-Ready Advanced Manufacturing Workforce

Multi-Disciplinary Experiential Learning Pedagogy

Industry 4.0 is rapidly transforming workplaces in Singapore and globally. It is, however, not just about the development and adoption of new technologies where Operation Technology (OT) and Information Technology (IT) converge. Instead, human resource and capability development remain at the core of every company's transformation to stay competitive. Both employers and employees must ensure that they are capable of embracing the new technologies as well as mastering the right skills to become future-ready.

In support of this transformation, the soon-to-be-launched Temasek Polytechnic Advanced Manufacturing Centre (TP AMC) is a learning enterprise set up to equip learners with emerging skills needed across major job

roles in advanced manufacturing. The Centre houses an end-to-end 'live' smart factory that produces high-mix low-volume products and leverages a multi-disciplinary experiential learning pedagogy for effective apprenticeships and on-the-job training (OJT).

Co-Developing Viable Solutions with Industry Partners

Beyond providing rigorous applied skills-based training, TP AMC aims to share best practices and innovative solutions, as well as co-develop commercially viable solutions with industry partners. A key feature of TP AMC is the cyber-physical system; the outcome of our close work with industry leaders such as Omron Electronics, Fujitsu, PD Solutions, M8M and Arcstone. The factory also integrates with Swisslog's Intra-Logistics Automation System (IAS) while a nerve centre monitors and controls production in real time. This unique approach, coupled with experience gained in setting up, operating and continuously developing capabilities through industry collaborations, is what sets TP AMC and its team apart.

Taking reference from the relevant Skills Frameworks, Industry Transformation Maps, international standards in advanced manufacturing and precision engineering, as well as the Smart Industries Readiness Index (SIRI), the TP AMC team is ready to work with companies to evaluate their technology gaps. We are also equipped with relevant tools and techniques to carry out human resource profiling with companies for talent management and development.

A Holistic Training Programme

TP AMC offers full-qualification training programmes and specialised short courses to enable trainees to pick up specialised skills which they can apply directly at work to embark on new projects in companies seeking to improve productivity. The training programmes will focus on holistic application of emerging skills such as AI at the Edge, Robotics & Automation, Industrial Internet of Thing (IIOT), Big Data Analytics, 3D Computer-Aided Design (CAD) & Modelling, Additive Manufacturing, Augmented Reality 3D Maintenance & Training, as well as IOT Cyber Security. Upon completion of these courses, trainees and companies are welcome to use our hardware and software facilities in the Centre to reinforce their learning and jointly test-bed their projects. Training programmes can also be customised to better meet each company's specific needs.

We believe that through forging strategic alliances with industry groups and leaders such as Singapore Semiconductor Industry Association (SSIA), we are able to ride the next wave of technology and be a catalyst in the manufacturing industry's move towards Industry 4.0. To this end, TP AMC is firmly committed to work in partnership with like-minded industry players to train and transform the manufacturing sector

If you are thinking about having your company embark on a transformative i4.0 journey, partner TP AMC and SSIA.

To explore how we can collaborate with you, please email Mr

Mark Khoo, Senior Manager, Temasek Polytechnic Advanced Manufacturing Centre at *contactamc@tp.edu.sg* or SSIA at *secretariat@ssia.org.sg*.

A QUICK OVERVIEW OF THE TP ADVANCED MANUFACTURING CENTER

- End-to-end 'live' smart factory that produces high-mix low-volume products
- Scale the most compelling digital transformation technologies
- Integrate the digital technologies with physical manufacturing system, bringing cyber-physical systems to production

Scan for more details

SOURCE OF CONTENTS

Temasek Polytechnic - Advanced Manufacturing Centre

NEW WISDOM OF ... SERIES

Wisdom of Developing a Global Perspective

These days if you are joining or leading a new team, cross country project, or global business unit that includes individuals from different countries, you must have a more global perspective. If you are so lucky to be called upon to go on a short or extended foreign assignment, please be open to taking it. In all cases, you must know how to behave and perform effectively. Here are things you can learn from another global professional's experience.

I met Kristi Stepp when she was in Singapore on an assignment for Kelly Services. She is a partner with Sigred Solutions, a management recruiting and leadership advisory firm. She has over 30 years of experience in the automotive, healthcare, beverage, and workforce solutions industries, and has broad international and multicultural expertise. Kristi served in various strategic human resource roles at several leading global organizations, including General Motors, Kelly Services, Pepsi-Cola, and Volkswagen.

She shared three insights that are key to having a global perspective when you work in a different country and culture with a diverse team.

Open Up To Listening And Learning

The first thing she said was she realized interestingly that she needed to relax. The company had made a considerable investment in her, and she (like most of us) wanted to go right in and start hitting goals. She said, "It was hard, but I had to take my own advice and resist the "take action" approach." She often uses the book "The First 90 Days" by Michael Watkins, to guide others and now needed it for herself. She was feeling a strong need to "prove myself" when what she first arrived when what she actually needed to do first was to open herself up to listening and learning. She said all the listening, learning, and relationship building she did early on contributed to her success during her three years in Asia.

What can we learn from this?

Whether you are going on an international assignment or joining or even leading a new team, business unit, or organization, Kristi's three words ring true: Listen, Learn, Build Relationships first.

Just like when I went on my first global assignment to the Dallas TX, I had to learn to relax, fit in, and resist trying to focus only on my goals immediately. It is hard to resist we are all good at "taking action," as Kristi stated above. What you will need to do is more listening, learning, and relationship building. By doing these three things early, it will contribute to your assignment success, especially if it is your first.

Approach The Entire Experience As An Adventure

Her second global perspective insight, she suggested, was focusing on one's mindset. She said she decided to approach the entire experience as an adventure. She modeled this behavior for her children, which is why she believes they reflect on the experience so positively. When they felt like there was something they were missing from home, like a favorite food, they quickly replaced that with a curiosity for what was available locally. They started by exploring Singapore like tourists and, in time, made great friends and felt right at home.

What can we learn from this?

Having a global perspective starts with assimilating as fast as you can. The more you can treat it like an adventure will make it much easier for it to become one of the lifelong memories that you will love to keep sharing with others. The trick is not to just see things from your perspective and realize everyone has unique ways to contribute. Instead of a focus on what the team or place does not have that you are familiar with, you have to replace it with what you found or have. Wherever you are these days, you can almost get anything anywhere in the world, and from a team's perspective you have to learn and be comfortable working with a diverse (probably global) team.

Find A Mentor Or Coach For Yourself

Then I asked her, "If you had to do it all over again, what would you do differently?" Kristi replied:

"If I did it all over again, I would have set better expectations and have taken some of the pressure off myself. I wanted to do too much too soon. Luckily, I had leaders who understood the importance of learning and provided me time to do that. My advice to others is to make sure you have a great coach to help you through the first 90 to 120 days. This type of change is full of transition traps that you may not foresee."

Using what made you successful in the past may make you fail fast in another culture and country. Suspend your need to problem solve and actively listen and learn. You'll benefit, both personally and professionally."

What can we learn from this?

Even if you think you can and know what to do in a foreign location or a new global team, you should find a mentor or coach for yourself for your global assignments. Remember going on a business trip for a few days is totally different than living there. The same goes with working with foreign colleges on regular calls is different than working with them day to day.

Always be open to learning new things; it is the only way forward, especially in these times. Set better expectations for the new normal
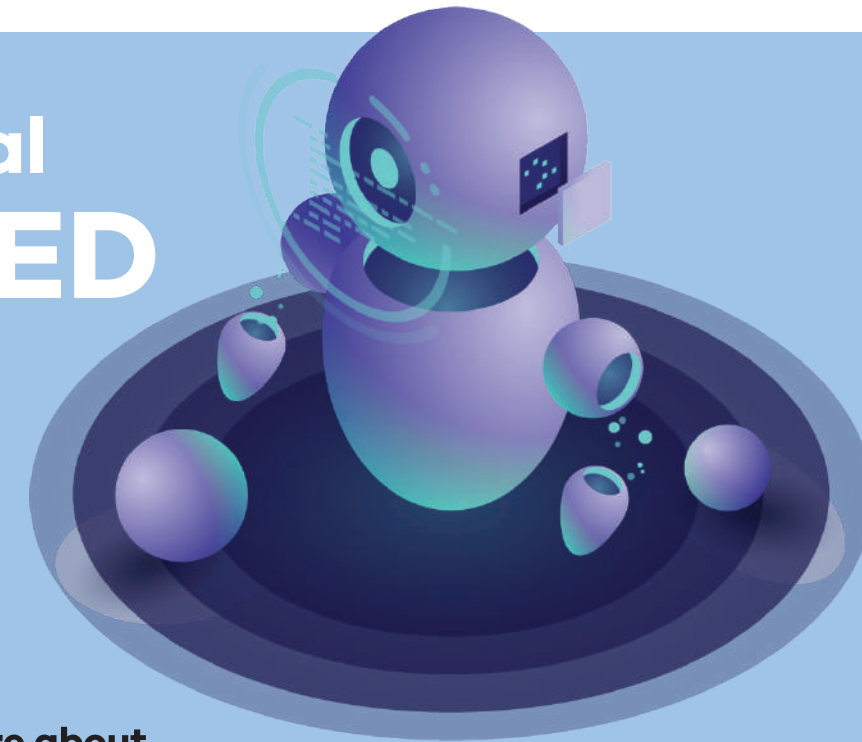
as things will unlikely be the same ever again. And if you get asked to consider a global assignment, or take over a global team – take the perspective of, I am good enough and have the right perspective to make this another feather in my cap in my career.

ABOUT THE AUTHOR

STEPHEN KREMPL
is a former F200 leader, International Speaker, Best Selling Author, Facilitator, and Business Communication Coach. His latest book is "The 5% Zone: Visibility Strategies that Get You Noticed and Rewarded in Any Organization."

www.kremplcommunications.com

SSIA

ENABLING SINGAPORE SEMICONDUCTOR EXCELLENCE

Singapore Semiconductor Industry Association

SSIA Job Portal
LAUNCHED

Visit the portal and know more about what is happening in the semiconductor industry:

- Job Vacancies
- Possible Career Development
- Latest News and Updates
- Development of the Semiconductor Industry

For Graduates & Jobseekers:

Send in your resume and we will notify you if there is any opening that matches your skills and experience.

For Companies:

Contact us at secretariat@ssia.org.sg and we will help post your job vacancies on the job portal.

www.ssia.org.sg/jobs

SSIA
Singapore Semiconductor Industry Association

Follow us:

Now available on
Magzter Digital
Magazine Store

Singapore
Semiconductor Voice:
www.ssia.org.sg/voice

www.ssia.org.sg
PRICE: $6.00