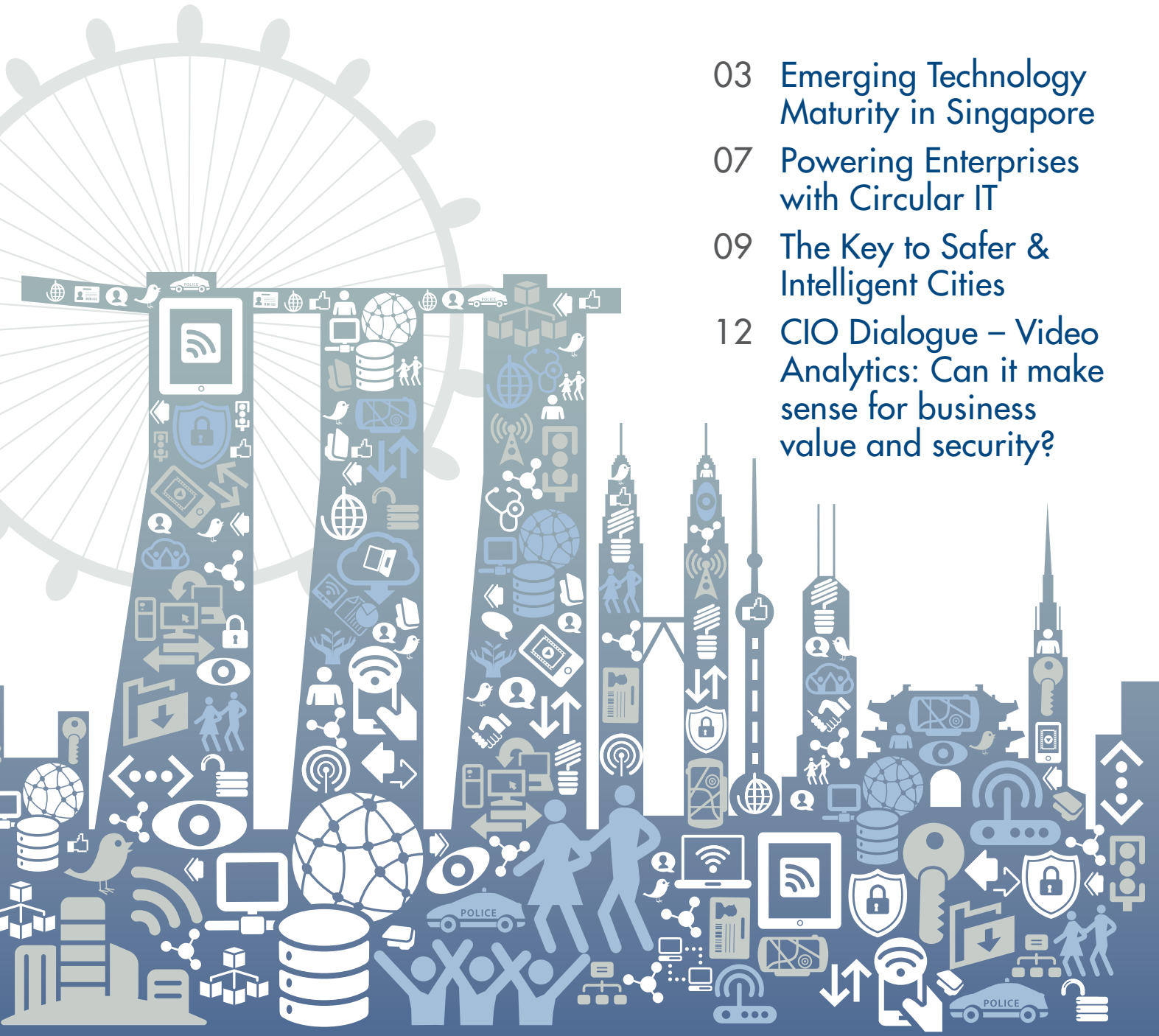


SWARF

Solutions for Urbanised Future

VOLUME 2 | www.ncs.com.sg

- 03 Emerging Technology Maturity in Singapore
- 07 Powering Enterprises with Circular IT
- 09 The Key to Safer & Intelligent Cities
- 12 CIO Dialogue – Video Analytics: Can it make sense for business value and security?



New Challenges Need New Technologies

We are entering the Age of the Customer, where customers want things faster, better, cheaper, and with a high level of service quality.

The environment has raised business stakeholders' expectations in terms of IT organisations supporting revenue growth, improving profitability and increasing customer loyalty.

These new levels of complexity can cripple organisations if they are not prepared for it. Emerging technologies offer significant business opportunities, but can be a major stumbling block for unprepared organisations.



Chia Wee Boon,
Chief Executive Officer, NCS

Organisations that ignore emerging technologies do so at their own expense. Emerging technologies – like mobility, Bring Your Own Devices (BYOD), business intelligence and Big Data, social computing, and cloud – ultimately contribute to economic growth for companies. But are Singapore organisations embracing these new technologies?

We wanted to find out about the adoption of emerging technologies among Singapore organisations, and commissioned Forrester Consulting to develop the NCS SURF Emerging Technology Index study. Based on a survey of 221 local organisations, it revealed some very interesting trends and insights. Read on for details on the study findings.

Our SURF Emerging Technology Index findings was also presented at TechConnect, our annual user conference held on 29 May. This year, we again had a distinguished panel of presenters who addressed many hot-button issues and topics, a summary of which is in this issue of SURF.

An interesting topic we explore this issue is that of creating safe urban cities. In this age of growing urbanisation, where half of the world's total population is living in urban cities, governments realise that a safe habitat has tremendous pay-offs, socially and economically.

Finally, we weigh the issues and potential of the fascinating field of

video analytics. Most organisations have reams of video footage lying around that is typically left untapped. Some recent developments in video analytics can turn all that “live” or archived video into useful, actionable intelligence – whether for security or even business purposes. Our report details an invigorating roundtable discussion we had on how organisations can get more out of video.



@ www.surfnation.net

f facebook.com/surfnation.net

✉ surfnation@ncs.com.sg



Emerging Technology Maturity in Singapore

Lack of business involvement is keeping Singapore organisations behind their Global Competition

Big data, digital engagement and awareness technologies are emerging technologies, but not independent market forces. Rather, they are coming together as part of a perfect storm of tech innovations to disrupt the way end-user organisations interact with their clients, drive innovation in their portfolios of products and services and ultimately deliver business value.

The question is whether Singapore organisations are ready to embrace these emerging technologies and operating models, and if they can transform these opportunities into real and measurable business value for their organisations.

With this in mind, NCS commissioned Forrester Consulting to understand the adoption and the maturity of emerging technology opportunities among public and private organisations in Singapore. The NCS SURF Emerging Technology Index study is based on a survey of 221 local organisations, to establish the maturity and adoption index across technology categories such as:

- **Digital enablement technologies** to engage with customers. This includes mobility, social media, websites and other digital channels. Singapore organisations leverage multiple channels as well as social networks to improve the way they engage with their clients and deliver services.

- **Information management technologies** offer revenue growth and profitability improvement opportunities. Information management includes big data, business analytics and predictive analytics. Organisations in Singapore are leveraging real-time analytics to identify cross-selling and upselling opportunities at the point of sale.
- **Awareness technologies** help organisations track, secure assets and improve situational awareness. Awareness technologies cover machine to machine (M2M) and Internet of Things technologies. M2M technologies allow machines to communicate with each other without human intervention.

To examine the state of adoption and maturity of emerging technologies over time in Singapore, Forrester asked organisations to self-assess their emerging technology maturity against a number of propositions which are grouped into 4 categories:

Strategy and vision

Do business stakeholders view emerging technologies as key competitive differentiators or generating new business value for the organisation?

Measurement and metrics

Organisations self assessed their capabilities to measure the return on investment of tech initiatives.

Organisation and execution

Does the organisation have the right resources, skills, solutions and processes in place to execute the technology initiative?

Technology capabilities

Ability to integrate the emerging technologies with existing information systems, including the systems of record and the systems of engagement.

Key findings from the survey revealed

- **Singapore lags leaders in terms of emerging technology adoption plans.** Singapore organisations are on a par with mature countries like the US, the UK, Japan and Australia in terms of current penetration levels for emerging technologies. However, future adoption plans are much more aggressive in other countries which will eventually leave Singapore organisations behind on the global scene. (See Figure 1)
- **Singapore organisations remain conservative in their adoption of emerging technologies.** By definition, adoption of emerging technologies will always be low. However, it is the interest and investment intentions of organisations as these technologies evolve that provides an indicator of future success.
- **Singapore organisations have an optimistic outlook on emerging technologies.**



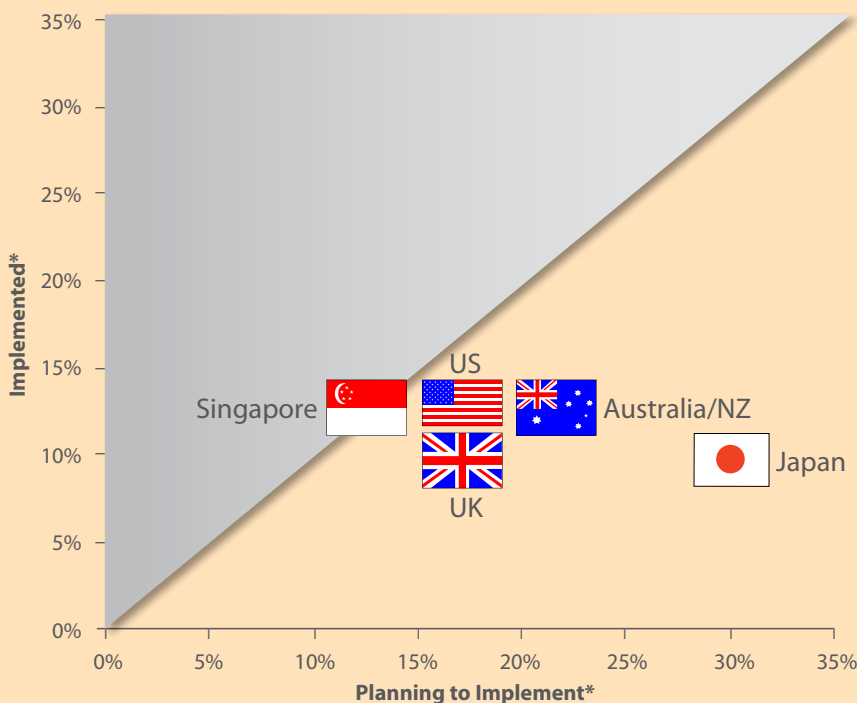
SURF EMERGING TECHNOLOGY INDEX

Even so, their adoption plans appear to be hampered by a lack of clarity about business value or the inability to communicate the strategic benefits of these technologies.

- **Maturity levels remain low across the different emerging technologies assessed.** This lack of maturity is also reflected across the vertical sectors analysed for this project. As the business environment

becomes more competitive in Singapore, there is an imperative for IT organisations to up their game and introduce emerging technologies that deliver value to their business stakeholders.

Figure 1 Singapore Lags In Terms of Emerging Technology Adoption Plans

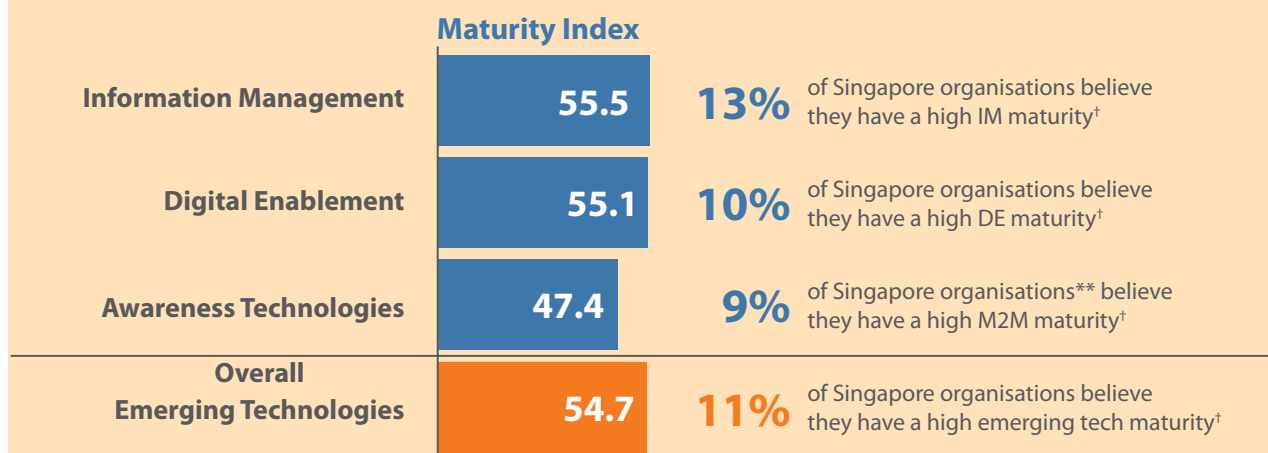


Base: 221 Singapore IT and business decision makers, 1680 IT and business decision makers globally (1042 US, 196 UK, 245 Australia/ NZ, 197 Japan) in Q2 2012, 1047 IT and business decision makers globally (670 US, 123 UK, 160 Australia/ NZ, 94 Japan) in Q4 2012

*Big Data, M2M and Digital Enablement combined.

Source: A commissioned study conducted by Forrester Consulting on behalf of NCS, July 2013; Foresights Budgets And Priorities Tracker Survey Q2 2012; Foresights Budgets And Priorities Tracker Survey Q4 2012

Figure 2 Emerging Technologies Maturity Indices (out of 100)



Base: 221 Singaporean IT and business decision makers

[†]High maturity: average maturity score >=4/5 | ^{**}Using/planning to use M2M technologies (34 companies) |

Source: A commissioned study conducted by Forrester Consulting on behalf of NCS, July 2013



Slower Adoption Among S'pore Companies

The resulting study found that while Singapore organisations tend to be mature technology adopters, they have not readily embraced emerging technologies. (Figure 2)

Specifically for big data, only 9% of companies have plans to adopt it in 2013. Despite the lower levels of adoption, the majority of companies from most sectors have indicated that they are interested in big data solutions including the government (91%), discrete manufacturing (70%) and transport sectors (63%) as well as others.

Adoption levels of machine-to-machine (M2M) technologies are low as well, with only 5% of companies indicating plans to adopt M2M in 2013. The majority of companies cite security concerns (50%) as factors. Other key barriers to adoption include or the lack of

technology maturity (43%), integration challenges (43%) and total cost of ownership concerns (43%).

In terms of digital engagement, less than one-quarter of companies' senior leadership viewed digital engagement as a major competitive differentiator for the organisation. Compared to other mature markets, the influence of the business team on digital engagement is not as high, which is a contributing factor towards low levels of maturity. Only 8% of the companies said corporate marketing was the final decision maker for applications that support digital customer experiences.

No Clear Business Case

Singapore organisations have limited plans to embrace emerging technologies due to several possible reasons, said Forrester. The IT organisation in Singapore tends to take the lead in the investment decisions and

implementation of technology solutions. They have remained risk averse and prefer to invest in technologies that solve a specific business problem as opposed to a generic technology solution. They also often fail to involve the business in the decision process. While this model has worked until now, Forrester believes that the lack of business stakeholder involvement is and will be a key roadblock in the successful adoption of emerging technology solutions such as big data, awareness and digital enablement technologies.

In addition, senior leadership does not view emerging technologies as major drivers of business value. Forrester believes that a majority of IT organisations do not understand the business strategy of their business unit. On the other hand, most business leaders when developing their business strategy omit to include IT. Technology integration is thought of as a critical element, although in reality technology integration is weak.

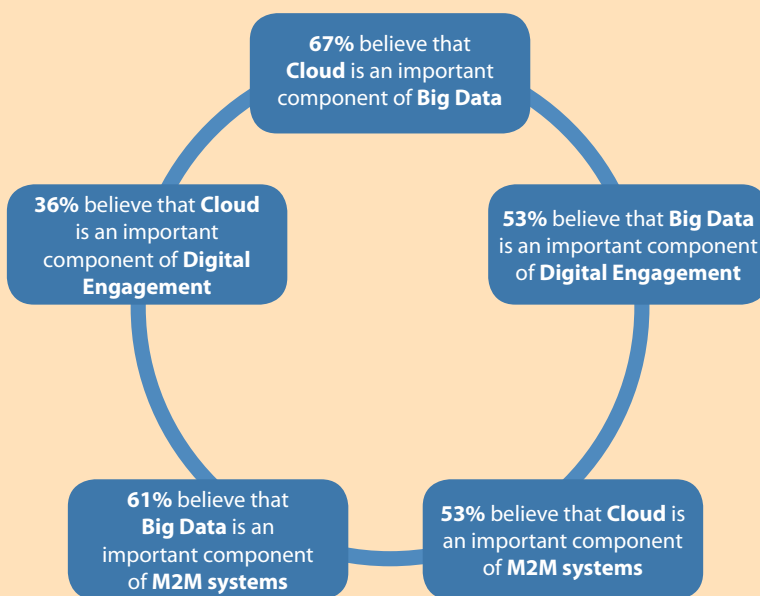
The majority of respondent organisations believe that big data, cloud, M2M and digital engagement technologies are all related and are important innovation components. (Figure 3)

Companies in Singapore understand that business innovation happens at the intersection of all these technology trends – the metaphoric “perfect storm” of technology innovation. However, this is mostly wishful thinking as in the real world, the linkages between different systems are often fragile, unreliable or non-existent.

The Proof-of-Process Approach

For successful implementation of emerging technologies, Forrester recommends that organisations need a more agile approach, to replace the traditional proof-of-concept with a

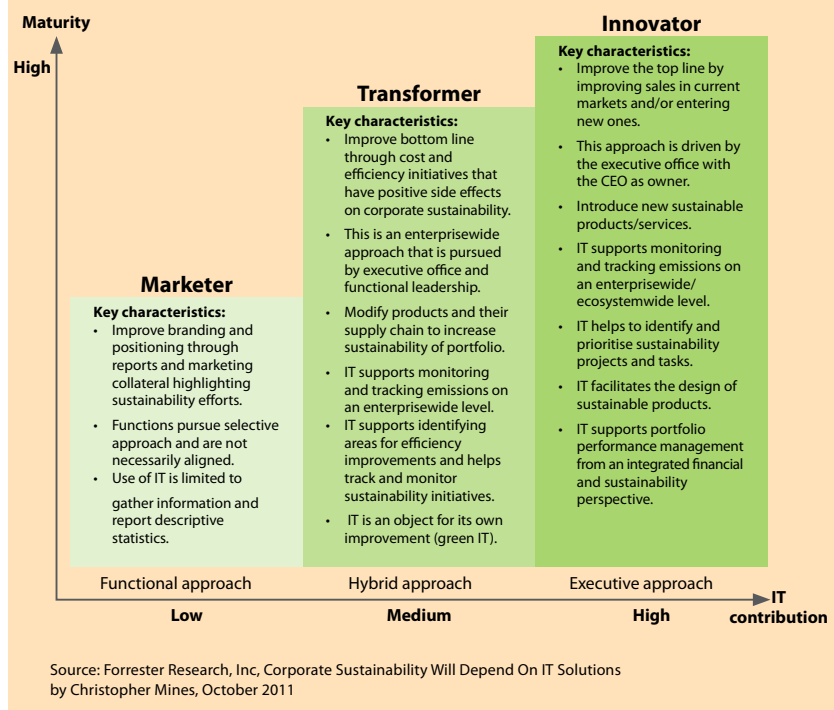
Figure 3 **Big Data, Cloud, Digital Engagement and M2M Are All Linked**



Base: 221 Singaporean IT and business decision makers
Source: A commissioned study conducted by Forrester Consulting on behalf of NCS, July 2013



Figure 4 **The Three Archetypes Of Sustainability Adoption — IT's Role Increases With Maturity**



stage, adding emerging technologies plans to existing business and technology roadmaps will help avoiding silos, identify dependencies and facilitate the integration with existing systems and business processes.

- Learn and grow the emerging technology maturity:** The proof-of-process approach enables IT organisations to constantly evaluate and learn. IT organisations need to refine and improve their emerging technology adoption processes and increase their maturity as they go. In particular, experience will enable them to better prioritise the opportunities, which will position them as a partner to the business and lead to more trust. For instance, Bring your own device (BYOD) will be identified as an urgent opportunity because the leadership wants to use tablets to access their dashboards on the go.

proof-of-process, in which there is a strong partnership between the IT and business stakeholders.

This agile proof-of-process approach enables the IT team to account for the unique characteristics of emerging technologies, including fast changing user requirements, immature vendor offerings, rapidly evolving and undiscovered uses as well as lack of skills. This proof-of-process should include the following activities:

- Watch and develop business use cases:** Organisations need to constantly track emerging technologies to identify opportunities that match business requirements to technology capability. IT organisations also need to have a good understanding of their organisation's business, both in terms of strategic plans as well as more tactical and practical requirements.

- Incubate and mitigate risks:** IT organisations need to seed the emerging technology and identify the right business sponsors. IT needs to support the business when the main risk is business related, as well as educate them in plain and business language when the risk is IT related. For instance, in a NFC/M2M project the IT organisation should talk about "location information" as a business capability – not the underlying technology. For banks, the process of merging transaction and location information to detect fraud is a business capability, not the technology.
- Assess the readiness and identify the right launch window:** Prioritisation of the opportunities therefore needs to be based on whether they are tactical – and denote business urgency – or are part of longer term strategic business values. At this

Implementing emerging technologies is ultimately about IT organisations partnering with business stakeholders – to support and educate them, to achieve the set business objectives. Finally, resource scarcity and tighter environmental standards are heightening the call for sustainable business models. Organisations have to look at increasing the role IT and emerging technologies play to drive sustainability and support circular economy. (See Figure 4)

To obtain a complimentary copy of the paper "Emerging Technology Maturity in Singapore", please email to

surfnation@ncs.com.sg

facebook.com/surfnation.net



Powering Enterprises with Circular IT

Growing resource scarcity and congestion problems in cities are forcing organisations to shift from a “take-make-dispose” linear approach to a circular, sustainable mode of operation.

NCS held its annual user event TechConnect on 29 May 2013 at Marina Bay Sands Expo. During the half-day event, more than 20 solutions were showcased and findings from a research on “Singapore’s Emerging Technologies Maturity Index” were shared.

In the opening address, NCS CEO Chia Wee Boon said that the circular economy is the next mega trend that will present the strategic imperative for CIOs.

With growing resource scarcity, and congestion problems in most urban cities, organisations need to rethink how they can reuse or refurbish waste. Organisations have to rethink their systems, processes and people deployment to move from a linear economy with its “take-make-dispose” approach to a circular economy. The concept of Circular IT provides a way to reduce wastage; enable collaborative consumption; and transform business models from products and services.

“We need to mine, harvest, use and dispose of equipment and data in a more responsible and circular way,” said Chia. For instance, ink cartridges, the latest smartphone, storage and IT systems, are all considered waste when they reach their end-of-life, despite having parts that can be recycled, refurbished or redeployed.

He painted a futuristic scenario, viewing life through the lens of a connected, middle-class consumer who is also a citizen of an urban city.

“By 2050, a projected 6.2 billion or 70% of the world population will live cheek by jowl in 2% of the world’s land-mass. This has massive implications on infrastructure, talent, and talent movement,” said Chia.

He noted that another effect is that customers are increasingly aware and value organisations that support sustainability. They pay a premium to buy products where animal testing is not performed and will support organisations that are environmentally friendly.

He shared about The Ellen MacArthur Foundation, an organisation setup with an aim to inspire a generation to re-think, re-design and build a positive future through the vision of a circular economy. Circular economy is about, “changing your business model, changing how you design, your materials, your vehicles, so you can recover the parts or components, so you can sell them or lease them in another way.”

“CIOs need to know what roles to take with this new agenda,” said Chia. “CIOs can champion the circular economy transformation across the organisation.” He suggested that CIOs could make use of technologies like big data, sensory and sentiment analysis from social media, to derive information insights and optimise the use of equipment, and reduce travel distances.

CIOs that adopt a shared services model can enable efficient and collaborative consumption through Business Process Outsourcing (BPO), where payroll, finance and



accounting and even customer service can be consolidated and centralised to support regional offices' needs.

Other ways that organisations can support circular economy are through:

- The reuse or refurbishing of materials. An example is Waste Producer Exchange (WPE), an auction platform in the United Kingdom for individuals and companies to trade different waste such as cardboard, oils, and food waste.
- Shift to a service-led business model, with the leasing of equipment.
- Better manage energy consumption. Currently, IT accounts for up to 70% of the total energy used in an average office building.
- Enable shared consumption through a collaborative approach across the value chain, involving customers, suppliers, partner and other stakeholders.

He cited how Dupont practises environmental and social stewardship, where it shed its businesses with big eco-footprints, and stopped the production of carpets and nylon. This happened based on the analysis that both business and environmental risks would outweigh potential contribution to future earnings.

Another example is Sara Lee, which spurred innovation by setting up a Global Environment Management Systems (GEMs) to help design, source, produce, package and distribute their products, in order to minimise their impact on the eco-system throughout their lifecycle.

A Competitive Advantage

Becoming circular is no longer a secondary issue, but a competitive concern, and should be handled as aggressively as cost, quality and speed, said Chia. As a result, CIOs need to consider 2 key questions: 1) Within IT, where are the

opportunities for CIOs to enable circular economy?

- 2) How can CIOs champion the circular economy transformation for the organisation?

SingTel has proactively taken steps towards a circular economy, in its Project Silverline, where it refurbishes used iPhones for senior citizens. The donated phones will have their data wiped out, and SingTel's suite of senior-friendly apps will be loaded onto the phones before they are given to the seniors.

For NCS, they have taken the step of refreshing 400 laptops for school children whose families do not have the means to purchase a laptop.

A Cloud Era

The next speaker, Steve Illingworth, CTO of Pivotal, noted that the cloud era, powered by new experiences and new business models, is changing IT. Driving this change is the big data and the Internet of Things.

"Big data is associated with a big problem.... Big data is no use if you can't make it fast," said Illingworth.

He also introduced Pivotal, a new start up from EMC which aims to provide companies with a new platform that can combine data, application and cloud fabrics, allowing companies to ingest a large amount of data in real-time, turn that data into useful information to allow companies to react fast.

Managing Agility

The next speaker, Ng See Sing, Head of Portal City at NCS, addressed the audience on the topic of "Integrating Systems of Digital Engagement". To succeed in a circular economy, organisations need to ensure that they address needs by creating value for its customers, tap on experts, and evolve by being agile – in order to minimise waste and avoid mistakes, he said.

On the other hand, not managing agility can result in over-runs of budgets and timelines, and projects becoming out of control. Ng then identified some solutions for agility: mobile applications development and management platform, dynamic engagement tablet apps, enterprise social portal solutions, and a calendaring eco system.

Neo Chia Yann, Director, Consulting Practice at NCS, talked about the relevance of emerging technologies to organisations. She noted that since the earliest man, all technologies go through the same hype cycle. As a result, there are five fundamental lessons that can guide organisations in the adoption of emerging technology.

These include:

1. Know what the Emerging Technology is all about.
2. Address what's in it for your organisation and tie that to desired outcomes
3. Know how much it will cost
4. Show how it is being done
5. Try it!

In order to accelerate the emerging technology roadmap, some approaches include initiating a workshop for both business and IT leaders, develop a circular IT business case that is aligned to business and sustainability outcomes, leverage sample roadmap, and conduct a proof of concept.



Scan the QR code to download slides presented at NCS TechConnect 2013



The Key to Safer & Intelligent Cities

Smart cities lay the foundation to build safe and sustainable environments.

With half of the world's total population living in urban cities, the growing congestion in cities coupled with growing economic, social and spatial inequalities is a recipe for growing levels of crime and violence.

When governments build safe and smart cities, it makes for an attractive habitat and encourages a thriving community. Many of the world's major cities – San Francisco, Seoul, Singapore, Amsterdam, Cairo, Dubai, Kochi, Shanghai – are attempting smart city projects, aided by multinational corporations. Smart cities use modern information and communication technologies to transform its infrastructure, be more resource efficient, and it lays the groundwork for better services, and a safer environment for a growing population.

The world's various smart city projects fall into some broad categories:

- **Greater environmental sustainability.** Cities like Stockholm aim to achieve greater environmental sustainability through smarter operations, employing state-of-the-art technologies in a bid to measure its energy usage, with the goal of reducing emissions and using energy more efficiently.
- **To attract people and businesses.** Other cities aim to use technology to enhance the quality of life for its citizens. Two examples of this strategy are Korea's "Ubiquitous City (U-City)", and Deutsche Telekom's "T-City" in Germany. Another example is Dubai's Smart-City project which aims to build a smart city network

with Malta and Kochi. New cities added to this network are immediately associated with the Smart-City brand, which is attractive to knowledge-intensive businesses.

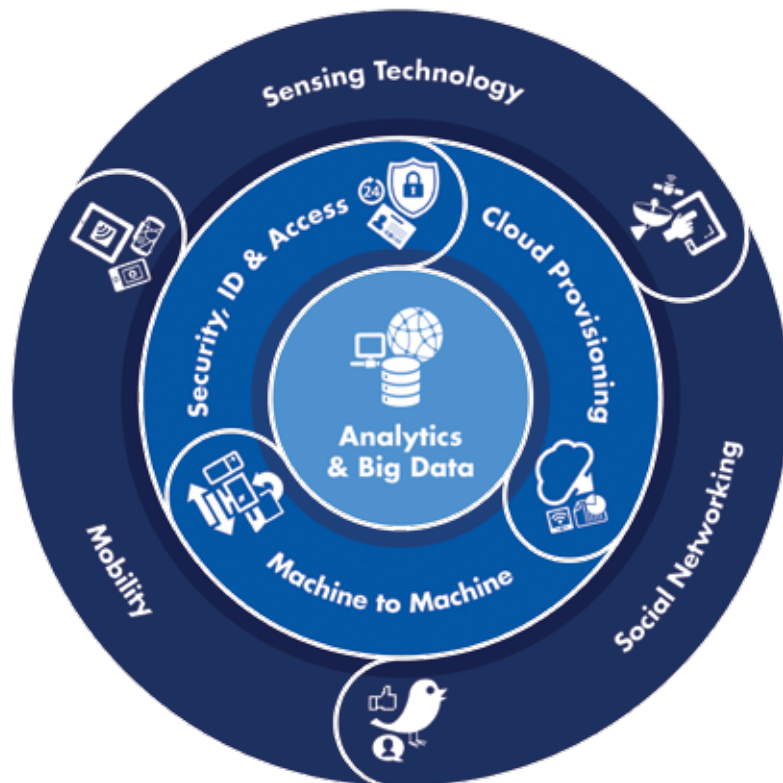
- **Safety and resilience.** Putting in place a robust infrastructure with resilient technologies can ensure that the smart city can handle and recover quickly from natural or manmade disasters. Such robust infrastructures also tend to be more sustainable and efficient, and are stable and reliable during a crisis situation. It also means having systems in place that have access to information, and the ability to analyse, report and disseminate information on safety or hazardous situations.

Key Technologies

There are several technologies that are fundamental to the development and evolution of the smart and safe city. They include the following:

- **M2M & Internet of Things**
Smart and safe cities rely on being increasingly connected – where computers, sensors, and smartphones, etc. can "talk" to each other, to transmit and receive data. This network of connections is known as the Internet of Things (IOT), or machine-to-machine (M2M) technology.

M2M is essentially communications technology that allows machines to speak to, monitor and control intelligent machines that are connected without any human





intervention, and these connections happen via mobile networks, wireless or other networks.

M2M can be used in a wide range of situations: radio frequency identification (RFID) tags; sensor nodes, Complex Event Processing (CEP), and cloud management. M2M applications are useful for surveillance, to keep track of all incidents and alert authorities, and can help to shorten response times. It can sense the presence of fire, high voltage, toxic substances, or excessive water, and allow the monitoring of critical public infrastructure, such as water treatment facilities or bridges, with little or no human intervention.

For companies, it can also help to maintain inventory, help scientists conduct research, and enable smart utility metering. It can enable the smart home by allowing you to remotely see and hear what is going on in the house, and detect whether the gas is on or the water tap is running when there is no one home.

Based on the data generated by sensor networks, it is also possible to use powerful business intelligence software to forecast trends and help city leaders make decisions related to urban management. Many cities already have repositories of data collected from video cameras, meters, Global Positioning System (GPS) devices, and sensors. To make use of this data, governments can collate all this data and use business intelligence and analytical software to identify trends and patterns to inform their planning and decision-making.

Cloud Computing

As the smart and safe city is built on the bedrock of information access, it will see the migration of applications, services and infrastructure onto the cloud to take advantage of the benefits of cloud provisioning – cost savings, reach, scalability, elasticity, flexibility and agility.

Cloud provisioning will help the connection of appliances to the cloud in the Internet of Things. The cloud will provide the means to access sensor data remotely, to distribute and to share information with multiple users over large geographical dispositions. Cities tend to have their data in silos, and smart city solutions would need the foundation of the cloud to access this data.

Cloud computing can enable public safety agencies to share resources – public safety apps, documents, video recordings – without having to maintain their own dedicated hardware and systems. Different public safety agencies can also use hosted, managed services on the cloud, such as Software-as-a-Service. Once on the cloud, public safety agencies can benefit from large-scale collaborations.

Mobility & Digital Engagement

The connected urban citizen with their smartphones, tablets and various mobile devices has set the bar for cities that are becoming more “smart”.

The area of near field communication (NFC) is helping to enable a “smart” way of life. NFC-enabled environments allow citizens to use mobile devices to conduct contactless payment transactions and allow seamless data exchange.

Mobility apps are also used to access information portals on the cloud. Drivers and users of the public transportation system can access traffic-related information on their fingertips. Patients can access their personal health records on their mobile devices and view their schedule of medical appointments and prescription lists through their health app. Students can attend lectures, access learning content, discuss with teachers and collaborate with fellow students through mobility apps.

Public safety officers are able to act quickly and knowledgeably when equipped with dependable mobile public safety communications technology. Parents concerned with the safety and security of their charges can also track and monitor the location of the children via mobility apps.

Big Data

The huge amount of data amassed by cities and organisations has made it easier to get some things done. But at the same time, managing this huge volume of data, also known as “big data”, is a critical element of becoming a smart and safe city. The ability to analyse and utilise this data can help cities to manage its transportation, security, energy management, and offer public services more intelligently and efficiently.

The use of data is growing rapidly at an exponential rate. These include operational data generated from enterprise IT applications and sensors; research data from academic and R&D institutions; and the ocean of text, audio and video content uploaded daily onto social media sites on the Web.

Big Data analytics can go through the rich repositories of historical data and statistics in sectors such as transport, healthcare and education. Past traffic data will give policy makers and transport planners valuable insight into traffic patterns and bottlenecks, and provide traffic managers with real-time recommendations.

Likewise, the massive patient health records databases and hospital treatment records present an invaluable resource for both healthcare researchers and those formulating healthcare policies, in terms of demographics and pathology trends. In education, past student performances over the years can be analysed to gauge the effectiveness of education policies.



Intelligent City Projects



Stockholm: Enhances Public Safety With Sensors

Sensors can help improve public safety, as demonstrated by a

SafeCity project in Stockholm's Arlanda airport. Analysis and environmental sensors were used to increase situation awareness and detect hazards. Late last year, SafeCity simulated a train accident in the tunnels under the airport. A total of 31 sensors in the tunnel and on the train, monitored and collected data such as temperature and levels of potentially dangerous materials, including smoke, CO², CO and other gases.

SafeCity is the first real-life demonstration using 'generic enablers' running on the Seville FI-WARE test-bed platform. FI-WARE is an EU initiative to promote new, reusable, shared elements and functions of Future Internet service infrastructure (so-called generic enablers).



Malaysia: Arrests Crime with GIS and RFID Technologies

Malaysia has in place a GIS crime mapping system

called "Safe City Monitoring System" that is central to the country's crime prevention effort. It can monitor the implementation of safe city measures in areas under the local councils, and to better monitor crime and plan deployment of manpower. The Safe City Monitoring System helps the police force to identify high crime areas, and allows them to study crime patterns and potential crime variables and determinants.

RM72m (US\$23m) has been set aside for 151 local authorities to adopt the department's Safe City Programme.

Malaysia is also planning to implement a smart registration number plate system (e-Plat) to discourage car theft. e-Plat will be using Radio Frequency Identification (RFID) technology, to help identify, locate and sense the conditions of objects, and will be an electronic identification card that is attached to metal licence plates to automatically identify vehicles and verify they are properly registered. e-Plat can also help the police to detect the criminals and location of stolen cars.



Thailand: Software to Measure Air Pollution

Thailand is using software to measure air pollution levels in Bangkok, and

to assess the risk level of residents to carcinogenic fumes. A key source of the pollution is from car exhaust pipes. The software can record the levels of toxic substances in the air. This information provides government agencies with more accurate data, which enables them to develop preventive measures for long-term pollution control.

Later in 2013, the government plans to allow the public to download this software to keep personal records of the density of fumes, so that the data collected can be consolidated with the public database to calculate density levels of carcinogenic fumes and substances in their neighbourhoods.

The software can also be used in emergency cases, like an explosion, to assess the risk of exposure to

individuals. The portable gas chromatographs-mass spectrometer can identify the type and quantity of carcinogenic substances in the air.



Singapore: Embarks on Safe City Project

The island state is starting on a "Safe City Test Bed" project which aims to test

advanced technologies to improve public safety. This R&D initiative involves setting up test beds to enable different government agencies to integrate and analyse data collected from existing sensors and network systems by using advanced analytic and information sharing tools.

The Safe City Test Bed spearheaded by the Safety and Security Industry Programme Office (SSIPO), is jointly established by the Ministry of Home Affairs (MHA) and the Singapore Economic Development Board (SEDB) to develop a Safety and Security industry with innovation capabilities. Cassidian, a worldwide leader in defence and security solutions, together with NCS, is one of the four consortia, awarded the Safe City Test Bed.

The Safe City Test Bed aims to enhance innovation capacity in industry to create new solutions which enable government agencies to integrate information and sensors in an automated manner, and derive analytical insights all in real-time. These capabilities, built on top of existing operating systems, are expected to improve situational awareness, inter-agency coordination and anticipation of security threats while optimising the use of manpower.



Video Analytics: Can it make sense for business value and security?

The time is ripe for video analytics, as it becomes economically and commercially viable for security and business needs, said roundtable participants.

Surveillance video footage is typically left untapped – but recent developments in video analytics can turn all that “live” or archived video into useful, actionable intelligence, according to a roundtable discussion titled “Getting More Out of Video: Video Analytics for Surveillance and Business Excellence”.

Held at the Raffles Hotel in Singapore, this executive roundtable was attended

by senior level IT executives, moderated by T.C. Seow, Editor of *CIO Asia* magazine, and sponsored by NCS.

Dr Neo Shi Yong, CEO of Kai Square, a provider of video surveillance and video analytics solutions and NCS partner, started the discussion by contrasting the difference between video recording and video analytics. While video

recording just involves playback, video analytics “is not a closed topic, but can mean a lot of things, and its interpretation can vary, depending on how it is to be used.”

He noted that the video analytics market has not progressed much in the past few years, as it can be complex to implement, have hefty costs and demand significant computational power. However, Singapore has the



From L to R: Mr Wong Soon Nam, Dr Neo Shi Yong, Mr T.C. Seow, Mr Desmond Aw, Ms Yong Yuan Teng, Mr Goh Jie Wei, Mr Richard Jones, Ms Lee Tzu Jen Jessica, Mr Lin He, Mr Eugene Chang, Mr Aw Yong Sai Khoon, Mr Suresh Kumar T and Ms Lee Soon Lan



potential to be a video analytics adopter, as many retail shops and offices already have closed-circuit television (CCTV) cameras in place.

Full of Potential

The roundtable participants represented a diversity of industries and all expressed interest in video analytics technology for different reasons – whether to get more out of the hours of CCTV footage stored on tape, for surveillance, or to grow their business.

“We capture a lot of details on video that is stored on tape that no one looks at it, and thought video analytics would help,” said Lee Soon Lan, Senior Assistant Director (DC & EUC), at Infocomm Development Authority of Singapore. She helps take care of data centres at the Ministry of Manpower.

For the National Environment Agency (NEA), they are considering the use of video analytics to survey levels of cleanliness in public places and hawker centres, both for the Department of Public Cleanliness and the Hawker centre division. Another consideration is to monitor the littering and smoking situation in certain hotspots in Singapore, said Yong Yuan Teng, Assistant Director (Application Services), CIO Office, Environment Health Department at NEA, the public organisation responsible for Singapore’s environment.

Property management firm Jones Lang Lasalle is exploring the use for video analytics for its fully managed facilities, and whether there is a business case for this technology to be offered to its clients, said Richard Jones, Director of IT Infrastructure & Operations, Asia Pacific, Jones Lang Lasalle.

Desmond Aw, Group Head, Regional

IT at Boardroom, a provider of share registry, investor communication and voting services to companies, said his company is considering the use of video analytics for shareholder analytics, to discern shareholder sentiment and to detect troublemakers during Annual General Meetings (AGMs).

Enhancing patient care and service levels are the goals for Khoo Teck Puat Hospital, said Jessica Lee Tzu Jen, Deputy Director, Hospital IS.

Intelligent surveillance video is useful for warehouses in Agility’s charge. “We have various warehouses of different size and shapes, dark and cold rooms, and would like to see how this technology can help us,” said Suresh Kumar T, Assistant IT Director, Asia Pacific region, Agility International Logistics.

Security and Business Needs

In response to the different industry needs, Neo explained that most of these needs fall into two broad categories of video analytics solutions. Kai Square has segmented these two categories into two video analytics packages: a Security package and a Business Intelligence (BI) package.

The Security package is about using video analytics to detect suspicious behaviour and trigger alerts. “The security package is more applicable for office premises, helping to protect assets and minimise unforeseen operational loss. It has modules like loitering, intrusion, perimeter defence, and provides real time alerts to your phones. The event is captured with a video snapshot and playback, so you can make an informed choice,” said Neo.

The BI package provides business intelligence by converting videos into quantifiable business data –

such as user profiles and behaviours – that can be acted upon.

For instance, the BI package can help mall owners with statistics such as people traffic flow patterns, and people profiles – whether male/female, young/old. That way, the mall owner can approach potential tenants with data that justifies the higher rental for shops with a premium location which experience 75% of the human traffic, in contrast to a shop with a lower rental rate that has just 25% of the traffic.

In answer to a question on whether video analytics can reconcile data from a particular event/sales program/festival, Neo said that a typical approach is to hire staff to do a statistical count using manual click counters on a periodic or event basis. In contrast, video analytics can offer a constant flow of information, which can be used to measure against data gleaned during promotions and events.

“It is clearer whether the event was attractive and met its objectives, as the results or ROI is actually put down in statistics,” said Neo.

Jones queried whether video analytics can interface with other data, such as marketing campaigns, existing portfolios, and other existing data. “How effectively does video analytics deal with data, and does it interface well with existing data?”

Wong Soon Nam, Vice President of IT at NCS, responded: “CEP [Complex Event Processing] deals with structured and unstructured data, [like voice and video], especially in defence, where some correlation is found based on taking in all sorts of intelligence ... However, this is another realm of discussion, of which video analytics is a branch.”



In response to a query on how easy it is to customise video analytics to get the necessary results, Neo said: “To craft a video analytics solution, you need to know the rules, and programing is needed.

He cited the example of developing a solution to identify whether someone is littering. It could be based on three rules: someone is throwing something, the object must fall down, and the object does not fly up. The team will study to see if the three rules are achievable, and if so, customisation can be provided.

Adoption Concerns

While there is a high level of interest in video analytics technology, the participants highlighted some technology adoption concerns.

For Jones, “The biggest concern to make this a business-viable option is ROI [Return on Investment], the concern is the cost of [video] storage and initial setup to get an effective video analytics solution working.”

With large warehouses and cold rooms to monitor, Kumar wondered whether specific skills are required to implement video analytics technology.

Wong responded that a cloud-based video analytics service would “solve the CAPEX [Capital Expenditure] or business problem by making it utility based.” With a low monthly fee, users are assured that they always have the most updated application, and the requisite technical expertise would reside with the service provider. This would be unlike non-cloud based video analytics applications that require a heavy upfront investment.

“The whole idea is to move from a CAPEX to an OPEX (Operating Expense) model, where you pay as

you use – whether you want to activate 5 or 10 cameras, and which features.”

He added that companies that view video analytics as an expense will not find a business case for it, but if it is used to grow a business, then there is a business case.

However, he cautioned that domain expertise in each line of business to define what needs to be analysed, is critical to ensure implementation success.

Wong added: “Predictive and proactive intervention is where video analytics comes into play. We are trying to go a step further than CCTV video footage. Once we can do

predictive intervention, we can use video analytics as a business enabler.”

He cited an example of digital signage using video analytics. If the system can profile and know the person looking at the advertisement is a man, the advertisement can be contextualised to suit the viewer, compared to today’s static ads. If the viewer is smiling, the advertisement can shift to offer pricing information. However, if the viewer is perceived to be upset, it can scroll to another advertisement.

Wong observed that video analytics solutions have come a long way. “In the old days, something happens and you go search the archives... If you

Delegates at the roundtable

Mr Suresh Kumar T, IT Director, Infrastructure Asia Pacific Region, Logistics Services Pte Ltd

Mr Desmond Aw, Group Head, Regional IT, Boardroom Ltd

Mr Eugene Chang, Director (Operation & Support), Systems Management, Defence Science & Technology Agency

Ms Lee Soon Lan, Senior Assistant Director, Technical Services, Infocomm Development Authority of Singapore

Mr Richard Jones, Director, IT Infrastructure & Operations, Asia Pacific, Jones Lang LaSalle Pte Ltd

Ms Lee Tzu Jen Jessica, Deputy Director, Hospital IS, Khoo Teck Puat Hospital

Mr Goh Jie Wei, Environment Health Executive (Intelligence), National Environment Agency

Ms Yong Yuan Teng, Assistant Director (Application Services), CIO Office, National Environment Agency

Mr Aw Yong Sai Khoon, General Manager, Information Systems Division, Pioneer Electronics AsiaCentre Pte Ltd

Dr Neo Shi Yong, Chief Executive Officer, KAI Square Pte Ltd

Mr Lin He, Head of IT, Uniplas Enterprises Pte Ltd

Mr Wong Soon Nam, Vice President, Communications Engineering, NCS

Mr James Ng, Head, Strategy & Planning, Bid Support and Marketing Communication, NCS

Moderator:

Mr T.C. Seow, Editor, CIO Asia



want to investigate all instances of a lady in red loitering around your organisation's premise, it may have taken 30 days, but now it can be dished out in minutes."

He added that the cost of video storage has also reduced dramatically. "Today, a simple digital recorder can record 30 days of video, at a very affordable S\$100 per recorder. And if you don't want to archive it, you can rewrite the disk."

Privacy Challenges

Jones proceeded to query the privacy challenges of video analytics. Neo responded that there are two kinds of analytics in the cloud. One model sees all the processing – analysis and video data – being held at a localised shop, at the premise. Only the analytical data goes back to the cloud. Security is ensured in Kai Square's solution where all the data transferred is encrypted using the same encryption technique as the US government to secure top secret data transfer. The other model has all the analytics running on the cloud, and that requires video to be transferred to the cloud.

The defence industry is extremely cautious when it comes to privacy, said Eugene Chang King, Director, Operations & Support, Defence Science & Technology Agency. "In our business, we have to be paranoid. We use our own infrastructure... Video analytics is not new for the military. You can read stories about how the US used advanced video analytics to hunt for terrorists."

Wong agreed that the defence industry is way ahead of the curve in video analytics adoption. "Many things such as face indexing, was done long ago. We are looking to bring such sophisticated technology into the commercial world.

Technology has become far more accurate. For instance, to discern that a person is smiling used to be 50% accurate, now it is 90% accurate. At 90% accuracy, it has become relevant for commercial usage."

Novel Approach

The participants also suggested some novel uses for video analytics applications, such as to analyse crowd behaviour during an AGM, said Aw.

Chang suggested that video analytics would be useful for casinos to analyse customer behaviour, to observe cheating behaviour and identify the culprit by matching it with a database of cheats that the casino may have.

While in a hospital scenario, video analytics can be used to look out for patients who have fallen, as nurses have a lot on their plate, and such technology would be a useful complement to provide alerts.

James Ng, Head, Strategy & Planning, Bid Support and Marketing Communications at NCS, opined that everyone is a potential customer of nursing homes, where video analytics can help to reduce the number of care givers required to monitor the elderly moving around.

Jones suggested that video analytics can be used to identify driving styles, and to provide alerts when a driver's eyes are off the road. Neo added that some companies are looking into this, and it is called driver audit, where alerts are given if sleepy eyes are detected, or if eyes are found looking to the left or right for too long, while the vehicle is moving.

A RFID Replacement?

Aw Yong Sai Khoon, General Manager, Information Systems Division at Pioneer Electronic Asiacentre, asked whether video

analytics is viable as a radio-frequency identification (RFID) substitute.

Wong responded that RFID suits an application that needs to be very specific and precise in counting. In video analytics, what is not captured by the video, will not be considered and cause a counting error.

"If accuracy to the digit is required, RFID would be a more suitable solution. Analytics is not a counting tool, plus you need a very good camera. A camera with poor quality images may mean flawed decisions."

Aw Yong also asked what features video analytics can detect. Neo answered that in image processing, it can detect global and local features. Global features typically fall into four categories: shape, colour, edges like corners and lines, and fine or grainy texture. Local features are more individual characteristics.

Lin He, Head of IT at Uniplas, a plastics and injection-moulding company, queried whether the video analytics software requires specific hardware.

While some standard hardware is recommended, most hardware is supported, said Neo. Wong pointed out that the quality of the hardware will affect the quality of the analysis. For instance, old CCTV cameras which only record in monochrome, will negate the possibility of any analysis based on colour.

Finally, Wong suggested that video analytics is a compelling proposition for Singapore, given the tight labour market. It can help to relieve the manpower crunch, by helping to complement jobs like security guards, where humans have limited alertness and attention.

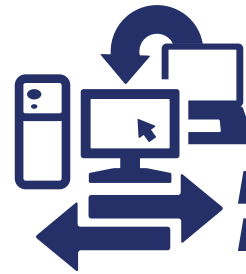
Sense the Unknown for High Impact Marketing and Security



SURF
Solutions for Urbanised Future



Sensing Technology



Machine to Machine



Security, ID & Access



To find out more about **Video Analytics-as-a-Service**, email us at m2m@ncs.com.sg

Looking for ways to battle the physical threats posed by environmental events? Or to improve business efficiencies with optimised customer service and operations? Seize the opportunity now to examine how smart surveillance systems can benefit your organisation with our newly launched Video-Analytics-as-a Service Solution!

Powered by

