

# SUARF

Solutions for Urbanised Future

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Opening Up  
New Vistas  
with Actionable  
Intelligence

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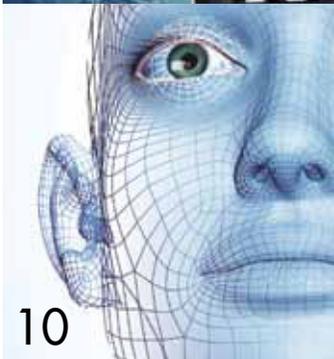
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# Transforming Data into Actionable Intelligence

Sensing real-time information, unlocking the value of data and gaining unparalleled insights to transform business.

Organisations today have rich depository of data from their business systems – most of which are not curated, analysed and visualised at all. Some of the data sets are so huge and complex that it become a challenge for companies to garner any insights for decision-making purpose.

The growing volume of real-time data, increasing competition, cost and regulatory pressures and the reduced time for decision-making, are compelling organisations to turn to real-time operational intelligence systems, to derive actionable intelligence.

Defined as any information that can help to boost a company’s strategic position against the competition, actionable intelligence is all about delivering the right information, to the right person, and at the right time so as to make better decisions to yield higher business value.

This ability to utilise actionable insights is a hallmark of organisations that adopt a customer or business-centric approach, where they are constantly thinking, sensing and connecting in a secured environment.

## The State of Things

Today, organisations face the challenge of making important



operational decisions within a short time frame, based on whatever information they may have on hand – which could be scattered, incomplete or even delayed. The data can be from various sources: customers, partners, suppliers, websites, emails, social media, application systems, and from sensors from the Internet of Things. The speed that these diverse and voluminous data are made available is forcing enterprises to interact with their customers differently in order to tailor solutions that meet their needs.

While business analytics is an investment priority for CIOs, its usage is still limited. The Gartner report “Actionable Analytics Will Be Driven by Mobile, Social and Big Data Forces in 2013 and Beyond” said that only 30 percent of potential users in an organisation adopt CIO-sponsored analytics tools.

However, in the same report, Gartner notes that this trend is changing. With the adoption of capabilities like natural-language interfaces (text and voice) and availability of realistic visualisation, analytics has become less “invisible”, more accessible and transparent to the users.

## Empowering Actionable Intelligence through SURF

Solutions for Urbanised Future (SURF) manifests NCS’ vision of a vibrant, smart and sustainable city. SURF crystallises NCS’ capabilities and solutions for a connected and urbanised future by harnessing our in-depth domain knowledge, illustrating through proven solutions, and innovating with emerging technologies. SURF undertakes a people-centric approach and a robust framework to ensure seamless integration of processes and systems.



# TRANSFORMING DATA INTO ACTIONABLE INTELLIGENCE

Organisations seeking to boost their business performance can harness the power of SURF technologies to sense, think and connect. To do this, companies have to harmonise the data, processes and systems so as to enable change.

Some common pitfalls include leaving critical data un-analysed in some archaic legacy applications and not fully optimising data collected from sensors to build up information awareness.

It is important that the data connection between and to the sensors should be secured, analysed and optimised to enable new processes or business breakthroughs. Companies also need to factor in business objectives, scenarios and technological feasibility when designing, planning and building these solutions across the IT systems.

Ensuring an integration of technologies will require a profound change with significant efforts to institutionalise a human-centric approach – whether it is an employee-, customer- or citizen-centric approach – to increase business and operational excellence.

These attributes of SURF technologies are the fundamental building blocks to spurring actionable intelligence. These technologies are integrated to:

**SENSE** – The Internet of Things has become increasingly important as we face threats from the external environment and are vulnerable to vandalism and terrorist attacks. From smart home appliances to smart machines, to wearables and RFID tagging, sensing technologies are deployed to collect user-centric data to boost marketing and operational excellence.

**THINK** – With the combined prowess of big data and analytics and their rapid proliferation as part of the

enterprise business, the possibilities are infinite. The data-driven intelligence, culled through sensing technologies, can power your business with unprecedented insights, enabling actionable plans to address business challenges.

**CONNECT** – Connecting and translating the treasure trove of knowledge, ideas and resources into actions is an important step in the entire ecosystem. Providing on-the-go touch-points through mobility and social networks is essential in ensuring constant collaboration and community engagement.

A resilient and secure network and systems is fundamental to ensure that all government agencies’ and enterprises’ data sets are protected. Security and cloud technologies, together with a strong infrastructure and network, are essentials that form the core of all organisations.

## Benefits of Actionable Insights

The insights from analytics can help organisations increase situational awareness to:

**A) Improve customer experience:** Execute a new marketing initiative based on insights into customer preferences and behaviour; Synthesise customer data streams into actionable business strategies for sales and marketing departments; or launch a new product based on the competitive landscape.

**B) Enhance cyber security & minimize fraudulent practices:** Identify areas of key risk, fraud, error or misuse.

**C) Increase operational efficiency:** Improve business and operational efficiencies; verify process effectiveness; and influence business decisions.





## A) Improve Customer Experience

Customer-oriented analytics can provide insights into customer preferences, usage patterns and demand trends for retailers, financial institutions, manufacturers, and other organisations.

A key area is in customer-related activities, such as marketing. Organisations can work in their marketing strategy by analysing data in real-time from across the Internet, social media platforms etc, to provide insights for customer acquisition, engagement and retention. User behaviours can be tracked in real-time to provide updated information on sales and marketing campaigns that need tweaking, allowing the marketing department to respond immediately, or to inform when a product upgrade is due.

Retailers can offer a promotional coupon or product suggestions that are based on customer preferences or location. This could be via the mobile phone, over the counter, Web or email.

In the call center scenario, actionable insights can provide data on the correlation between the length of customer contact time and customer satisfaction, or whether the new agents are familiar with new products, or which agents need more training.

## B) Enhance Cyber Security & Minimise Fraudulent Practices

Actionable intelligence aids organisations to be more agile and counter the criminals' intent to hack into computer systems by uncovering security events before the situation occurs or worsens, or to help staff focus on attending to the more critical security events.

Today, security events are committed far more quickly. There are also more hackers and criminals attacking more enterprises than before. Timely analytics

can help to uncover and prevent these activities from happening.

Actionable intelligence enables organisations to correlate different types of information from various sources to derive a larger threat picture and to detect different types of threats – such as insider threats, account takeover, cyber-espionage, or theft of money or information.

According to Gartner's report "Reality Check on Big Data Analytics for Cyber Security and Fraud", analytics can cut down on the noise and false alerts, and correlate the alerts across the different monitoring systems to detect the patterns of security violations and fraud. It can also profile accounts, users or other entities, and look for anomalous transactions against those profiles.

## C) Increase Operational Efficiencies

Actionable intelligence can provide feedback on how organisations can drive more operational efficiencies from existing investments – whether it is for equipment to determine its own maintenance schedule, or eke efficiencies in the supply chain.

An interesting area where operational efficiencies can be enhanced with actionable insights is in situation awareness for crowd management and operational efficiencies.

When it comes to organising and managing a major city event, the aggregation of technologies to Think, Sense and Connect is of paramount importance to ensure seamless crowd control management.

The collection of past event traffic and crowd density data provides an indication of hot spots and a prediction of incidents probability. Coupled with the current data

gathered from video analytics and social media feeds and wearable technologies, this will enable the operation command and control centre to have a full grasp of the situation.

Any potential aggressive behavior or increasingly overcrowded spots will immediately trigger alerts which can be communicated across social platforms and mobile devices. Necessary actions can then take place via a secured network to provide early intervention.

For Fast-Moving Consumer Goods (FMCG) manufacturing firms, the aggregated information of existing inventory data, in-store traffic flow and warehouse stock level sensing can be used to forecast orders, accelerate load optimisation and plan staff rosters.

For organisations that provide on-site servicing, alerting and assigning the nearby customer service officer who is within the closest proximity to the event can be activated using location-based information. Predictive analysis with real-time sensing data and robust reporting, can enable managers to more effectively address areas of emergency and close any operational gaps.

Ultimately, organisations should view technology as a means to an ends. As an enabler, the possibilities of integrating Sensing, Thinking, Connecting technologies are vast. So, start by mapping out your actionable intelligence roadmap to equip your organisation to derive timely, actionable insights that lead to precise and accurate business decisions.

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*Thought leader:*  
*James Ng,*  
*Head of SURF Program Office*



# Toward Actionable Insights with Video Data

M2M Video Analytics can help organisations make sense of vast amounts of security video and data, generating actionable intelligence for better decisions, faster and more effective action, and improved operations.

A revolution is underway in how connected devices are used for business operations – thanks to the rise of the Internet of Things (IOT), increasingly faster speeds and wider coverage of wireless networks, and the availability of more agile sensors.

Today, one of the most powerful sensors available in the IOT or machine-to-machine (M2M) landscape is surveillance cameras. However, the surveillance cameras' potential as a sensor has been largely untapped, as the huge volume of data generated everyday is discarded or stored away.

Powerful data analytics can convert this data into actionable intelligence that businesses can use for decision-making and real actionable outcomes. Video analytics would allow each camera or monitored

asset to be constantly connected to central systems, and a wide range of applications beyond security surveillance can be used on the data collected.

## Powerful, Actionable Insights

In particular, M2M-based video analytics offers many benefits over the surveillance camera or closed-circuit television (CCTV) system. The traditional approach can be a tricky and time-consuming business, as a significant amount of manpower is required for 24/7 surveillance.

In contrast, M2M Video Analytics uses sophisticated algorithms, is able to data mine the volumes of data, and analyse the smallest details. Analytics filters can be intelligently tailored to meet specific security or business needs.

With M2M Video Analytics being cloud-based, the storage of event video data is centralised and can easily scale up, and allows for easier access and deployment.

While it is generally true that a video analytics system can be expensive, this is certainly not the case for SingTel M2M Video Analytics. With M2M Video Analytics, it can augment an organisation's surveillance with intelligence previously available only on expensive premium systems. Video data can be streamed to tablets, laptops or mobile phones, and video analytics and reports can be generated from a web-based interface.

Unlike mainstream video surveillance systems in the market, which typically provide only the surveillance function, M2M Video Analytics is a complete video analytics solution combining two benefits in one platform: surveillance and analytics.

Compared to other solutions available in the market, SingTel M2M Video Analytics offers more capabilities at a far lower cost of ownership.

## Security Enhancements

M2M Video Analytics can handle traditional security needs, and allows the automatic analysis of large volumes of real-time or historical video surveillance data, and can trigger alerts and alarms. This speeds up response time to emergencies,





enabling proactive protection of monitored areas.

For example, if there's an intrusion or some other safety or security breach, an intrusion alert will be triggered and a message sent to the mobile device of choice. The video can be watched on demand and response to intrusions can via an event-based chat with an employee on-site. Automating security surveillance removes the need to have a dedicated security resource or headcount for surveillance purpose. Security personnel can use sensor networks that combine video, audio, and vibration detectors to spot unauthorised individuals who enter restricted areas.

### Commercial Applications

Besides enhanced security surveillance capabilities, SingTel M2M Video Analytics can help organisations to gain actionable intelligence to streamline operations, and improve customer experience. It is applicable to a wide variety of

industries such as banking & finance, hospitality, healthcare, retail, transportation, home automation, and the public sector.

For instance, retailers can use insights from video analytics to transform in-store engagement and enhance operational efficiencies. They can better understand customer behaviours to detect how long they linger at individual displays and record how long they watched an in-store video advertisements, or detect blockages to fire and emergency exits, or observe where there is high customer traffic and redeploy staff accordingly.

For governments, video analytics can help provide valuable insights to ensure smooth people flow in public places, to detect any incidents that require attention, and to use predictive modelling to optimise operations.

### What Is Next

Enterprises and governments are

already taking steps to participate in this world that is rapidly becoming connected with the Internet of Things or M2M technologies. The early adopters are seeing early pay-off, as they have optimised their operations, where traditional approaches have not been able.

From the technology perspective, advances in wireless networking technology and the falling cost of sensors is ushering even more on the journey to embracing the Internet of Things. For companies, these technological changes spell implications on how their competitors are making decisions, how businesses are run, and for those who choose to embark on adoption – a competitive edge.

Arrange for a product demonstration of SingTel M2M Video Analytics with our consultants today, by emailing us at [Askm2m@singtel.com](mailto:Askm2m@singtel.com), or learn more at [m2m.singtel.com/videoanalytics](http://m2m.singtel.com/videoanalytics).

## SingTel M2M Video Analytics – A Rich Set of Features

1. **Motion detection & tracking of moving objects:** Ability to detect intrusions, to identify objects or personnel in/out of virtual borderlines. Track objects or people and project moving paths to determine distance and speed. Concurrent tracking of multiple objects or people. Set speed parameters in car parks and roads to detect vehicle speed.
2. **Audience profiling:** Analysis on video footage can show the demographics of customers' gender, age — and registers their emotions as well — whether a product produces a smile, scowl, puzzled frown, or indifference. This type of intelligence enables organisations to formulate broad-based strategies for their general audience, and specific ones for target groups.
3. **Crowd density analysis:** The ability to tell where customer traffic is heaviest in a store or mall can be used as a basis to charge a premium for consignment booths in a high-visitor area of a store, or higher rental for dense-traffic shops in a mall.
4. **Clear indication of traffic flow:** This predicts the flow pattern in a set perimeter. It tracks how customers move within a store or mall. Retailers can optimise the positioning of signage and point-of-sale displays.
5. **Facts and figures:** The surveillance system can provide the numbers and details on which to base marketing campaigns, revenue forecasts and business targets.
6. **People counting:** Users can set a perimeter to detect people moving in or out, and can differentiate between objects and people to produce accurate data analysis. This application is designed for entrances and exits, to minimise counting errors caused by human and environmental factors.
7. **Density measurement/heat map:** Ability to count objects or personnel in/out of virtual borderlines. Ability to detect abnormal increase or changes in crowd density.



# Avoid the Technology Hype

Focus instead on solving real business problems for true actionable insights.

Technologies related to business analytics such as Big Data and Complex Event Processing are still experiencing much hype. This can be seen from their categorisation under “Peak of Inflated Expectations” in Gartner’s 2013 Hype Cycle for Emerging Technologies. While there are big promises about the value that Big Data & Analytics bring to the table, organisations must remain focused on solving real business problems rather than be deluged by the technology hype.

To avoid the hype and to ensure that insights gained from analytics are indeed useful and actionable, some key characteristics of actionable intelligence to look out for include:

**TIMELINESS.** The analytical insights should be produced in real-time to aid decision-making that is critical for business success. Eg. a marketing manager who needs sales volume information every morning to adjust her micro-marketing strategy dynamically can consider solutions with In-Memory Processing capabilities to speed up the data crunching. If decisions have to be made within seconds, eg. offering a telecommunications customer free talk-time at the very moment when he has just experienced two dropped calls within 5 minutes, Complex Event Processing might be the way to go.

**ACCESSIBILITY.** People who make everyday business decisions need easy access to analytical insights to make sound, evidence-based decisions. Solutions like Self-Service Business Intelligence can empower business users with free access to analytics. The solution offers a good

balance where the IT team controls the platform while giving business users the freedom to query and analyse data as and when they need.

**INTELLIGIBILITY.** The analytics team must ensure that the results are communicated to business users intelligibly for further actions to be taken. In the education context, the typical educator may not understand Predictive Analytics algorithms, but they can certainly understand the analytical output of a list of students who have a high risk of attrition and who they can target with intervention programmes. Intelligibility can also be achieved through Data Visualisation tools that transform raw numbers into visually appealing charts; a picture speaks a thousand words.

**ACCURACY.** Establishing trust in analytics is paramount for the benefits of this emerging technology to spread across the organisation. Such trust can arise from the user’s personal experience with using the analytical insights to make much better decisions. For example, a healthcare worker may be used to relying on gut feel and past encounters to decide on treatment prescribed. However, if it can be proven to him that Predictive Analytics results in much higher accuracy in prescribing the correct treatment, he would be more willing to trust and act on it.

**MEANINGFUL.** Analytical insights should always have business significance. For example, in the enthusiasm of embarking on an innovative Predictive Analytics project, an organisation decided to analyse past building energy consumption data to forecast future consumption

patterns. The motivation was to drive down the rising energy consumption costs in light of insights gained from historical Business Intelligence analysis. The analytics team developed an accurate forecasting model that could accurately predict energy usage for the next quarter. However, the management realised later that simply knowing the future usage patterns has practically no value-add to the existing green initiatives.

Before embarking on an analytics project, it is worthwhile to think through and ensure that the following 3 aspects are synchronised with one another.

**GATHERING DATA.** What types of data are required to support the business use case? Does the organisation already possess such data? How should the data be gathered and stored?

**ANALYSING DATA.** What data analysis techniques and tools are the most appropriate to solve the business problem? Can the business problem actually be solved using business analytics?

**ACTING ON INSIGHTS.** What is the business problem or use case? What are the final desired analytical insights? How should such insights be incorporated into business operations and decision-making?

An analytics project that is carefully designed with these three aspects in harmony to derive actionable intelligence is likely to generate tangible ROI for the business, instead of morphing into an irrelevant white elephant.



# Have You Optimised the Business Value of Your IT?

IT Business Management tools provide actionable insights on the cost and quality of current IT services.

As more organisations integrate sensors with dynamic data analytics into their current infrastructure and network, many may lack insight into the costs and quality of their current IT services – let alone the financial impact of these new IT initiatives.

This absence of insight means CIOs cannot effectively engage their line-of-business counterparts (LOBs) in meaningful discussions on how IT can drive business growth and innovation. On the business side, many CEOs and CFOs often favour IT cost reduction over investment, and do not understand the cost of IT services in terms of the value that they deliver to the business.

To be effective and to remain relevant, the CIO must understand the current cost and quality of existing IT services. With this information, he or she can make informed Return on Investment (ROI)-based decisions about which services should be delivered, by whom and at what cost. As a result, IT becomes a more effective partner to the business.

At VMware, we believe that a robust IT Business Management Suite should include strong data management (Extract, Transform and Load strength), a wide range of adapters to integrate data sources, and cost modelling flexibility. It features automated and repeatable benchmark capabilities, and supports virtual/cloud environments and services consumption-based models.

Another leading feature is the solution's flexibility, with on-premise and Software-as-a-Service (SaaS)

deployment options, as well as easy to maintain data configurations and scalable architecture.

## Optimising IT Business Management

Some of the examples on how organisations utilise VMware IT Business Management include:

- (1) Building a business case or operationalising cloud/virtual infrastructure initiatives
  - (a) Establishing a private cloud:
    - Pricing IT services
    - Billing customers (e.g. LOBs)
    - Capacity Planning of IT resources
  - (b) Transitioning to a hybrid cloud environment
    - Comparing private cloud infrastructure services against public cloud infrastructure services or comparing the cost of existing internal applications against outsourcing to SaaS
  - (c) Establishing optimal end user computing services
- 2) Data centre transformation initiatives
  - Marry all data centre costs (power, real-estate, etc.) with infrastructure and application costs to facilitate ongoing investment decisions
  - Baseline and benchmark the cost of data centres and the ROI of consolidation over time
- (3) Service portfolio management initiatives
  - CIOs can make decisions around the organisation's portfolio of services to ensure

IT is aligned with business priorities. Gain insight into which services to outsource or insource based on the quality and service level appropriate to the business.

- Define what services to offer, at what price, understanding those prices can be loss leaders or highly profitable
- Use services and pricing to shape demand, to take costs out of IT through promoting lower costs services or cutting underutilised or high cost services
- Determining the relative cost, service-level agreements (SLAs), and time-to-value of consuming and delivering services via any cloud model – private, public or hybrid.

To support the above, IT finance teams can perform:

- Budget variance analysis
- Headcount management
- Capital expenditure (Capex) and operating expenditure (Opex) management
- Bill of IT
- Scenario analysis

IT Business Management Software can help organisations make better and more informed decisions. With these insights, organisations are able to prioritise the initiatives that should be tackled first, and allow proactive versus reactive planning.

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*Contributed by: Taka M Uenishi, Product Marketing Manager, IT Business Management, VMware*



# Intelligent Imaging Solution Tells Your Age

The active learning algorithm is faster and more accurate in guessing the age of an individual than conventional algorithms

Scientists are developing artificial intelligence solutions for image processing, which have applications in many areas including advertising, entertainment, education and healthcare. They have, for example, developed computer algorithms for facial age classification — the automated assignment of individuals to predefined age groups based on their facial features as seen on video captures or still images.

Improving the accuracy of facial age classification, however, is not easy. A person can teach a computer to make better guesses by running its algorithm through a large database of facial images of which the age is known using sets of labeled images, but acquiring such a database can be both time-consuming and expensive. The process might even breach privacy in certain countries. Jian-Gang Wang at the A\*STAR Institution for Infocomm Research and co-workers<sup>1</sup> have now developed an algorithm called incremental bilateral two-dimensional linear discriminant analysis (IB2DLDA) that could overcome such problems.

The researchers designed IB2DLDA so that it actively 'learns'. The algorithm first processes a small pool of labeled images, and then iteratively selects the most informative samples from a large pool of unlabeled images to query the user, and the information is added to the training database. According to Wang, unlabeled



images that are markedly different to the labeled samples are the most informative. The 'active learning' approach significantly improves the efficiency of the algorithm and reduces the number of samples that need to be labeled, and hence the time and effort required to program the computer.

Based on their new findings, the researchers hope that it will become easier to build facial age

classification into intelligent machines. The technology could find use, for example, in digital signage where the machine determines the age group of the viewer and displays targeted advertisements designed for those age groups, or in interactive games where the machine automatically presents different games based on the players' age range. Wang adds, "A vending machine that can estimate the age of a buyer could be useful for products that involve age control, such as alcoholic drinks and cigarettes."

The researchers demonstrated that the active learning approach was much faster than random selection, and used only half the number of samples. The method is also suitable for handling problems with a large number of classes, and could one day be generalized to applications other than age estimation. "We are now planning to extend our method to other areas such as classifying human emotions and actions," says Wang.

The A\*STAR-affiliated researchers contributing to this research are from the Institution for Infocomm Research.

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## Reference

<sup>1</sup>Wang, J. G., Sung, E. & Yau, W. Y. Active learning for solving the incomplete data problem in facial age classification by the furthest nearest-neighbor criterion. *IEEE Transactions on Image Processing* 20, 2049–2062 (2011).



# Mobility: Delivering Actionable Intelligence While on the Go

Mobile usage for corporate activity has never been higher – what are the key issues and challenges?

Enterprises are adopting mobility and social media like never before, said the participants at a lunch discussion hosted by *CIO Asia* and sponsored by NCS. This took place during the CIO Conference 2014 held at Singapore's Marina Bay Sands on 13 March.

The adoption of mobility technologies enables users like C-level users, sales and operations staff to access actionable intelligence at their fingertips, enabling faster and better decisions to be made. The end result of mobility has enabled even more timely decisions that can boost a company's strategic position against the competition.

The lunch discussion started with an observation that mobility is now making a huge impact on enterprises, said Ng See Sing, Head, Portal City & Catalyst Group, Business Applications Services, Competency Centre, NCS.

"Enterprises are now embracing more mobility and social media. The key difference is that it is happening right now." He observed that as early as a year ago, there has been a real upswing in corporate mobility adoption.

The participants agreed that since the iPhone revolution, the industry focus has had a decidedly strong consumer focus, with an emphasis on a user-friendly experience, over technical features. It changed people's expectations of what they can do while on the go.

"We have to thank Steve Jobs," said Ng. "What he did with the iPhone,

means it is no longer a struggle to convince people that mobility can make a difference to their organisations, and it has encouraged CIOs to embrace mobility a bit more aggressively, though they may not have much of a choice."

## BYOD

Enterprise IT departments have faced pressure from users – both the C-level and workers – to expand the range of mobile devices that can be used to access enterprise data, applications, and for doing work, said T.C. Seow, Editor of *CIO Asia*, and the discussion moderator.

"Just three years ago, CIOs were frustrated about allowing mobile devices onto corporate networks. It was a no-no. But now when the CEO comes and says 'I want it now', what are CIOs going to do about it? The changes have been so rapid," noted Seow.

Most organisations now support BYOD (Bring Your Own Device), in a bid to keep employees happy, and to improve work productivity.

Many enterprises are now following the 'Choose Your Own Device' (CYOD) model, where they will pre-select mobile devices that employees can choose from, said Geraldine Pang, General Manager, IT, BW Maritime. The choices offered are typically Apple and Android devices.

Steven Sim, VP of IT at Maybank Kim Eng Securities, said that for its traders, or internal users, the IT

"Enterprises are now embracing more mobility and social media. The key difference is that it is happening right now."

— Ng See Sing





department supports the use of the iPad for trades. This allows the traders to have lunch outside the office and still make trades on a mobile device, as trading hours are 9am – 5pm.

However, for external customers, it supports all varieties of mobile devices. It even has a dedicated department that collects all manner of mobile devices for testing in order to provide support on its trading platform.

“If Xiaomi smartphones take off like those from Apple or Samsung, we have to be ready to support it,” said Sim.

### Security Concerns

In line with adopting BYOD, organisations have also ensured that they have an effective mobile device management system in place, along with various security measures, said the participants.

“People are always the weakest link, so we spend a lot of time educating end users. We hold talks, seminars,

send out security messages, and also do internal phishing tests – hoping to raise awareness,” said Lau Kai Cheong, CIO & VP, Integrated Information Technology Services, SMU.

For Jurong Port, as a Government-Linked Company (GLC), they have to comply with security directives and a more stringent security framework. This prevents the introduction of BYOD, as personal mobile devices are not allowed to be plugged into the corporate network.

“We may be quite happy to support this [BYOD], but the regulation side has not changed. That’s part of our difficulty,” said Sim Chear Wah, VP, IT, Jurong Port.

While security remains a concern, for most IT departments, the benefits of enabling workers on mobile devices outweigh the challenges, said Ng.

In terms of security measures, data encryption is one of the easiest and

most reliable methods of protecting data. “Nothing beats underlying data encryption, whether for transport layer security, or for data on mobile devices. Technically speaking, the best control is at the last mile,” said Ng.

Another challenge is to balance between managing the safety of corporate data, and providing the flexibility to keep employees happy, said Victor Chua, Director, Technology & Infrastructure Services, AMEA, InterContinental Hotels Group (Asia-Pacific).

“The reality is that we are trying to make something look simple, though we are really like a duck paddling furiously. It takes a lot of expert and engineering to make it [the mobility experience] seamless and safe,” he said.

“The user doesn’t want to deal with intricacies like whether its VPN, Internet, an internal network, MDM, Android or iOS. To them, WiFi is WiFi, full stop. It is up to us to really make it happen.”

### Legal Liability

Organisations also need to be mindful of legal liability, to clarify who owns the data on the handsets, and to ensure that wiping out personal data along with corporate data will not subject the organisation to any legal lawsuits, said Ng.

Ofir Shalev, CIO for Employee Health & Benefits, Asia, Mercer Singapore, agreed that deciding on data ownership is a key issue with mobility. Does the data belong to the owner of the device if it is bought by the employee? What happens when corporate data is mixed with personal data? What about privacy issues, can there be guarantees that personal data is not being looked at by unwanted eyes?

## Delegates at the roundtable

**Geraldine Pang**, BW Maritime, General Manager, IT

**Sim Bong Seng Steven**, VP, IT, Maybank Kim Eng Securities

**Lau Kai Cheong**, CIO & VP, Integrated Information Technology Services, SMU

**Victor Chua**, Director, Technology & Infrastructure Services, AMEA, Hotel InterContinental Hotels Group (Asia-Pacific)

**Sim Chear Wah**, VP, IT, Jurong Port

**Harry Chan**, Assistant VP, IT for Finance & Business Intelligence, Parkway Holdings

**Ofir Shalev**, CIO for Employee Health & Benefits, Asia, Mercer Singapore

**Ng Hwee Lan**, IS director, Asia Pacific, Allergan Singapore

**Koh Hwee Khim**, VP, IT, at Cargo Community Network

**Yeap Chin Boon**, VP, Group IT, Ascendas

**Chong Soo Hian**, VP, IT Services, NatSteel Holdings

**Ng See Sing**, Head, Portal City & Catalyst Group, Business Applications Services, Competency Centre, NCS

Moderator

**T.C. Seow**, Editor, *CIO Asia*



Chua noted that embracing mobility also involves change management, to balance autonomy, privacy and control.

“One of the biggest pushbacks we get, is if we put MDM on my device, what if you view my web browser history. That always gets people very nervous.”

Seow agreed that getting user buy-in is a challenge, especially as user expectations are sometimes changing at a faster rate than IT is prepared to support.

Harry Chan, Assistant VP, IT for Finance & Business Intelligence, Parkway Holdings, said that there is a difference in technology attitudes between different users.

“The doctors also want easy accessibility of patient records from home, and to access the scheduling when they meet the patients, especially the younger doctors,” said Chan. In contrast, “the older doctors can be quite concerned and even resistant about the launch of electronic medical records.”

Pang concurred that technology has become a basic requirement for attracting and retaining talent. “If we don’t provide VSAT Broadband on board our ships, they won’t join the ship. It makes a lot of difference.”

Data roaming while on business travel is another important requirement to keep staff happy, as some view it as a prerequisite to do work, said Pang. The challenge is to keep a cap on data roaming costs.

Ultimately, as an increasing number of enterprises are moving mobility initiatives to the fore, they need to develop the relevant systems and policies to ensure users get the productivity benefits of mobility while not exposing the organisation to any unnecessary risk.

# Paving the Way for Better Collaboration

Collaborative tools have changed corporate cultures and communications, as well as transformed business processes and customer interactions.

The consumerisation of IT has been the biggest driver of enterprise collaboration, agreed participants at the in-depth discussions that took place at the four different Executive Networking Table (ENT) discussions with over 20 senior level IT executives participating.

These discussions were hosted by Ng See Sing, Head, Portal City & Catalyst Group, Business Applications Services, Competency Centre, NCS and Neal Cross, Vice President, MasterCard Labs Asia, Middle East and Africa, during the CIO Conference 2014 held at Singapore’s Marina Bay Sands.

The discussions highlighted some of the key trends and issues faced by organisations in the enterprise collaboration space. One such trend is how the consumerisation of IT has enabled better communications in the marketplace, affecting how organisations adopt collaboration practices and technologies both within an organisation and with external parties like partners, suppliers and customers.

A key catalyst for IT consumerisation and the widespread adoption of mobile computing has been Apple smartphones, which have shifted

focus to the importance of usable technology, where the experience of using a piece of technology outstrips its features, said Ng.

Added Cross: “Smart phones and mobile devices have changed the technological and social landscape globally, the advent of wearable devices are likely to again make changes to the way we live and work.”

Two participants talked about how easy collaborative applications are to deploy and use. A representative from the hospitality industry said their corporation is using the suite of Google applications – Gmail, Google Docs, Google Calendar, etc. – a solution that has proven to be fast to set up and very cost-effective.

Another highlighted how easy it is to collaborate between colleagues in different countries in different languages, using the multi-lingual features on collaboration software, and how calling a person is as easy as “mousing” over their name.

## Death of Email?

Some participants said that this ease of communicating and the popularity of social media may result in the eventual demise of email as a form of communication. They agreed that email would



continue to be relevant in the immediate future though its usefulness might wane further down the road.

However, just as the fax machine has refused to go away with some banks still viewing faxes as a legally binding document, emails may also live on due to legal requirements.

"It took a long time for the fax to be accepted as a legal document. Regulation and legislation is always trying to play catch up [with technology advances]," said another participant.

"The important thing is choice in your communication channel," said Cross. "I can see that my colleague is online based on his presence status [on a collaborative application], and I know he's in a meeting. I could then "ping" him on IM [Instant Messaging] and not ring him. But if he is away from his desk, I will then call him."

### Social Collaboration

Social media has started to become more widely used by corporates, both inside and outside the company.

Even as applications like Dropbox and WhatsApp provide opportunities to enhance existing collaborative efforts across teams, marketplaces, and organisations, the challenge is supporting and integrating these applications within the corporate framework, said a participant.

On the topic of mobile devices, a growing number of workers are using their mobile devices for work. Some organisations have adopted a hybrid version of Bring Your Own Device (BYOD), which one participant termed "CYOD" or "Choose Your Own Device", where the organisation has tested and chosen specific types and models of mobile devices that employees can use for corporate purposes.

"This is a more manageable hybrid model vs having employees bring in the devices of their choice."

Besides mobility devices, one organisation even supports the Apple laptops as alternative workstations, as a growing number of its employees prefer the Mac platform over the Windows environment.

Part of enabling collaboration within the organisation involves knowledge sharing among employees. A participant from the transportation industry noted that the organisation has tried to capture the wealth of experience of its workers in the late 50s by using video. This has proven to be more efficient than asking them to capture this knowledge in a document or written form.

"Technology and mobility have been the catalyst for our knowledge management," he said. The organisation also encourages a culture

of learning and sharing of information.

When employees participate in collaboration, they can earn tokens that add up to product redemptions. Employees are also encouraged to take photos of useful ideas on their travels overseas, and to upload these ideas. The organisation has even developed 20 mobile apps for both in-house use and for customers, to encourage them to submit ideas.

### Collaboration in Different Sectors

Collaborative practices between partners on the supply chain have enabled them to tap deeply into efficiency gains, observed Ng.

He cited the example of WalMart and Del Monte, how WalMart is willing to release detailed sales information related to Del Monte products to a middleman. This daily visibility into the demand and inventory levels at each store and distribution centre has enabled Del Monte to avoid having overstocked or under stocked scenarios.

A participant from a chip design and packaging company said they have evolved from their engineers doing collaborative design with customers. They have moved onto procurement collaboration, where information is shared with supplier, where they receive their purchase orders (POs), returns and invoices through the collaborative system, instead of via emails and phone calls.

A participant from a statutory board involved with the Singapore environment said that free wifi is being rolled out in Singapore parks, to offer park goers a visual experience, and in turn, they will be able to get their general profiles, interests and preferences. This will allow the statutory board to offer additional services to meet customer needs.



There were concerns from another participant from the legal industry on the legalities of cross-border collaboration. With cloud computing transcending national borders, a concern they faced is compliance with German and European data protection laws. Cross-border collaboration also raises security concerns about who owns the data, and whether there is control.

However, they concluded that despite the security challenges, the capability to collaborate still needs to be available, or the competitors will get an edge. "You need to do

it, if not, someone else will."

A participant from an education institution commented that they have tried to limit teachers engaging with students on social media. However, many teachers still prefer to use Facebook to communicate with students who are usually reachable on Facebook once they are online.

As a result, technology use guidelines have evolved, where one approach sees the onus of responsibility resting on the users, said a participant from the hospitality industry. "What is acceptable use has now shifted to

what is responsible use. The idea is that if you do something wrong, you are responsible and you are fired." "You can't stop the users, they will use all the things [technology] out there. Our role is to educate them, and ensure that the policies surrounding the use are out."

## Gen Y Workplace Expectations

With a growing number of Generation Y workers entering the workforce, a challenge is the expectations of the Gen Y, who are 'digital natives' and used to conversing on social media. "Some will make comments, fire and forget. Whether constructive or destructive, they don't really care... we try to encourage responsible behaviours," commented one participant.

Ng reminded that these comments are eternal "it is never off the record", and organisations need to be mindful as these comments may have a negative impact on corporate reputation.

"Another feature of social media is that you could end up being dragged in even though you are not participating in social media, but because other people are talking about you," he said.

To attract and retain Gen Y workers, corporate technology must at least keep pace with what this generation is used to, such as working on the go, and ensuring that work can take place anytime, anywhere.

Ultimately, the discussions agreed that collaborative tools have made an indelible mark on how organisations communicate, their cultures, and helped to transform business processes and customer interactions.

"The collaboration space is here to stay, the question is how to make it work for everybody," said Ng.

## Streamline Mobile App Development with OneMobility™

Mobile applications have enabled business workers to interact and work in real-time, from any location, at any time.

However, mobile application development has its challenges if not performed in a managed, strategic and sustainable manner.

NCS recognises the need to have a strategic mobile application development platform to better control and support current and future application needs, and has built its own mobile application development platform.

OneMobility™ is a mobile application development platform that accelerates the design, development of native mobile applications on various devices' Operating System platforms. A proprietary platform, it provides the key competitive advantage of time-to-market, ease of content administration, and best practices in delivering mobility to your organisation and your customers, securely and effectively.

Customisable with ready plug-in technology, OneMobility™ also addresses major concerns on Governance for Mobile Applications Management (MAM), which needs to be a consistent approach to mobile applications development through a Mobile Applications Development Platform (MADP) and deployment and maintenance of mobile applications.

Complementing the OneMobility™ platform, NCS offers end-to-end managed mobility services ranging from consultancy in mobility strategy and apps development to hosting, provisioning, security management, and proven enterprise systems integration with major enterprise-backed systems.

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