New Think • New Theme • New Things
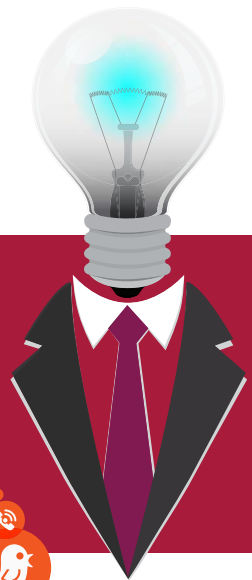
SID
SINGAPORE
INSTITUTE OF
DIRECTORS

BOARDS AND INNOVATION

SID Directors' Conference 2015

Conference Book
Wednesday, 16 September 2015

SID
SINGAPORE INSTITUTE OF DIRECTORS

Mission
To foster good governance and ethics in corporate leadership.

Vision
To be the national association advancing the highest level of ethical values, governance, and professional development of directors.

Formed in 1998, the Singapore Institute of Directors (SID) is the national association of company directors. It works closely with the authorities and regulators, and its network of members and professionals to uphold and enhance the highest standards of corporate governance and ethical conduct.

The SID's membership comprises mainly directors of commercial companies and non-profit organisations, as well as lawyers, accountants, academics and other professionals in the field of corporate governance. The affairs of the SID are directed by an elected Governing Council and managed by a Secretariat.

The SID has a comprehensive professional education curriculum that covers the entire spectrum of a director's developmental needs. Numerous courses cater to the different groups of directors – from aspiring and new directors, to experienced directors and Chairmen of Boards, and the various Board Committees.

In particular, the SID provides thought leadership on corporate governance and directorship issues. It keeps directors appraised of the latest thinking and happenings through a quarterly *Directors' Bulletin, Statements of Good Practices*, boards and directorship surveys, research publications, and forums and seminars.

To encourage excellence in corporate governance, the SID manages the Best Managed Board Award, the Best CEO Award and the Best Investor Relations Award; these are presented at the annual Singapore Corporate Awards which it co-organises with the Institute of Singapore Chartered Accountants and The Business Times. In addition, the SID and the NUS Centre for Governance, Institutions and Organisations (CGIO) produce the Singapore rankings for the ASEAN Corporate Governance Scorecard. Further the SID, CGIO and CPA Australia collaborate on the Singapore Governance and Transparency Index.

The SID also provides other value-add services to its members including regular networking events and socials, board appointment services, and a one-stop information service on governance related matters.

For more information, please visit *www.sid.org.sg* or contact the Secretariat at *(65) 6422 1188*.

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ORGANISING COMMITTEES
Conference Committee
Robert Chew (Chairman) | Wilson Chew | Calvin Chu | Derrick Kon | Georgina Kwa
Vinnie Lauria | Dileep Nair | Robin Pho | Oliver Tian | Wong Su-Yen

Innovation Gallery Committee
Robert Chew | Vinnie Lauria | Karen Mah | Tan Jung Hui

Secretariat
Joyce Koh | Chia Yi Hui | Florence Lum

SECTION
ONE

Conference Programme

CONFERENCE PROGRAMME

0800   **REGISTRATION**

0900   **WELCOME ADDRESS**

Mr Willie Cheng, *Chairman, SID*

GUEST-OF-HONOUR'S ADDRESS

Mr S Iswaran, *Minister, Prime Minister's Office;*

Second Minister for Home Affairs & Second Minister for Trade and Industry

0930   **KEYNOTE ADDRESS**

INNOVATION GOVERNANCE – ORGANISING AND MOBILISING FOR TOTAL INNOVATION

Emeritus Professor Jean-Philippe Deschamps, *IMD, Lausanne, Switzerland*

Most companies are not well set up to drive continuous innovation. Is innovation the responsibility of the C-suite or is it also a crucial part of the governance mission of the board of directors?

In his keynote address, Professor Deschamps who has researched, taught and consulted with top management teams and boards on innovation, will explain why the board should be concerned with innovation and the scope of innovation governance. He will suggest desirable board practices in this area and where and how boards can add value.

1000   **NETWORKING COFFEE BREAK**

1030   **PANEL DISCUSSION: GETTING INNOVATION ON BOARD**

Innovation is increasingly recognised as a key driver of companies' performance and growth. Yet, it has not been high, if at all, on many board agendas.

Why is this so? How can innovation be better managed and governed? What is the role that boards can play to shape a company's approach to innovation? What examples of innovation and innovation governance practices are there that can inspire local boards to follow?

A high-powered panel of local and international speakers, renowned for driving and delivering innovation in businesses, will address these and other questions.

Moderator:

Mr Scott Anthony, *Managing Partner, Innosight*

Panellists:

Mr Ang Kong Hua, *Chairman, Sembcorp Industries*

Emeritus Professor Jean-Philippe Deschamps, *IMD, Lausanne, Switzerland*

Mr Simon Israel, *Chairman, Singtel*

Ms Koh Soo Boon, *Managing Partner, iGlobe Partners*

Mr Lim Ho Seng, *Chairman, Baker Technology*

1200 SINGAPORE COMPANIES AND BOARDS CAN BE MORE INNOVATIVE AND CREATIVE

Mr Fredrik Härén, *Founder, interesting.org*

Being creative and innovative has never been more important than now but it is more difficult than most people think. Mr Härén, an expert on business creativity, will examine how businesses can be more creative and innovative and the pitfalls of not tuning in to today's globalised world.

Through humour and tapping on his vast experiences in idea generation, Mr Härén will inspire participants to develop (or at least, want to develop) their own creativity and that of their staff, and the creative and innovation culture of their organisations.

1225 GETTING HANDS-ON WITH INNOVATION

Mr Vinnie Lauria, *Managing Partner, Golden Gate Ventures*

There are many ways in which companies can ride on the innovation band wagon: through innovative business models, reengineering of business processes, organisational transformation, exploitation of emerging technologies, etc.

Mr Lauria, whose job is to identify and nurture innovative startups and ventures, will share the diverse forms of innovations, pointing in particular to the many innovations that participants can get up close within the Innovation Gallery.

1240 LUNCH IN THE INNOVATION GALLERY

Over 30 companies and startups will be showcasing their innovative concepts, products and services, business models, and technologies. Participants will be able to learn about and even try out some of these innovations while enjoying their favourite treats in a trade fair setting.

1430 INNOVATORS AND INNOVATIONS ROUNDUP

Hear from the innovators about their ideas and the stories behind them. A diverse set of innovations from across different sectors of the economy will be presented in SID roundup style – zappy briefs in serial fashion followed by Q&A session with the audience.

Moderator

Mr Dwight Hutchins, *Asia Pacific Managing Director, Strategy Consulting, Accenture*

Mr Steve Leonard, *Executive Deputy Chairman, IDA*
Country-level Innovation: From an Intelligent Island to the world's first Smart Nation nation with fuller use of technology to live, work and play

Mr Peter Overy, *Managing Director, IDEO Singapore*
Innovation in Design: Unlocking Singapore's creative potential

Conference Programme

1430   **Mr Dave Lim**, *Founding Director, Innovation X by Coca-Cola and TEDx Ambassador*
Innovation in Corporate Venturing: Adding new flavour to the Real Thing

Ms Esther An, *Chief Sustainability Officer, City Developments Limited*
Innovation in Buildings: Green solutions and practices for environmental sustainability

Mr Liak Teng Lit, *Group CEO, Alexandra Health System*
Innovation in Healthcare: Purging healthcare of "conventional" wisdom and reinventing healthcare

Mr Douglas Foo, *Founder and Executive Chairman, Sakae Holdings*
Innovation in Food: Sushi-ng with innovations one leap at a time to become the McDonald's of Japanese fast food

Mr Ray Hatoyama, *Managing Director, Sanrio Company Limited*
Innovation in Licensing: Say "hello" to a new Hello Kitty

Mr Nobu Okada, *CEO, Astroscale*
Innovation in Space: Clearing debris in the beyond

Mr Lee Poh Wah, *CEO, Lien Foundation*
Innovation in Philanthropy: Rocking the Cradle and Grave radically

Mr Andreas Heinecke, *Founder, Dialogue Social Enterprises*
Social Innovation: Changing the paradigm for the disabled to the differently abled

1645   **CLOSING REMARKS**

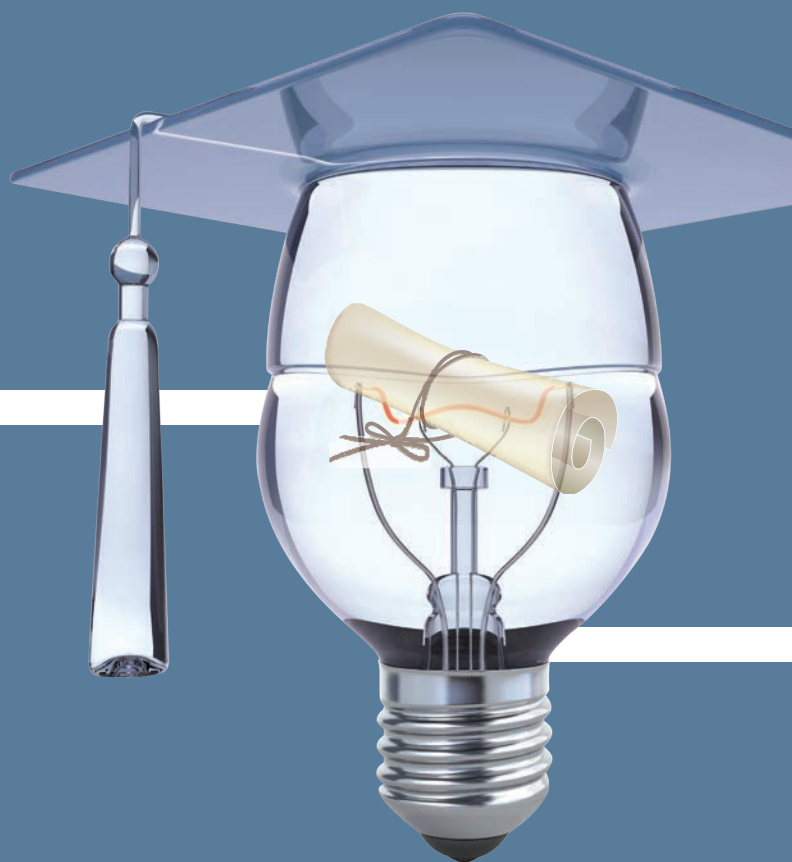**UNLEASHING YOUR CREATIVITY ON THURSDAY MORNING**

Mr Fredrik Härén, *Founder, interesting.org*

Continuing his theme that we can all be more innovative, Mr Härén will provide takeaways on how we can reignite that spark of creativity and innovation that is in each of us and our organisations.

1700   **END**

SECTION
TWO
Speaker Biographies

SPEAKER BIOGRAPHIES

Mr S Iswaran
Minister in Prime Minister's Office;
Second Minister for Home Affairs;
Second Minister for Trade and Industry

Mr S Iswaran read Economics at the University of Adelaide and graduated with First Class Honours. Mr Iswaran also holds a Masters in Public Administration from Harvard University.

Mr Iswaran joined the Singapore Administrative Service in 1987, and held appointments in the Ministry of Home Affairs and Ministry of Education. In 1991, he was seconded to the National Trades Union Congress. Subsequently, he was seconded to the Singapore Indian Development Association as its Chief Executive Officer.

In 1995, Mr Iswaran assumed the post of Director for International Trade at the Ministry of Trade and Industry. He then moved on to the private sector, joining Singapore Technologies Pte Ltd as its Director for Strategic Development. In 1998, Mr Iswaran was appointed Senior Vice-President/Managing Director at Temasek Holdings Pte Ltd where he undertook investments in the pharmaceuticals, biotech, hi-tech manufacturing, transport and logistics sectors and as well as managed several takeovers, buy-outs and merger transactions.

Mr Iswaran has been elected as a Member of Parliament in four General Elections since 2 January 1997. He was the Deputy Speaker of Parliament from September 2004 to June 2006.

Mr Iswaran was first appointed Minister of State for Trade and Industry on 1 July 2006, and was subsequently appointed Senior Minister of State for Trade and Industry on 1 April 2008. A year later, Mr Iswaran was also appointed Senior Minister of State for Education, in addition to his appointment at the Trade and Industry Ministry. On 21 May 2011, Mr Iswaran was appointed Minister in the Prime Minister's Office and Second Minister for Home Affairs and Trade & Industry.

Mr Iswaran was a member of the India-Singapore Closer Economic Cooperation Agreement Joint Study Group, the Government Parliamentary Committees for National Development & Environment as well as for Community Development & Sports, the Remaking Singapore Committee, the Supervisory Panel of the Feedback Unit and the Network India Steering Committee.

Mr Willie Cheng
Chairman,
Singapore Institute of Directors

Mr Willie Cheng is a former managing partner of Accenture, a global management consulting and technology services firm. Since his retirement in 2003, he has stayed involved with the business and the infocomm communities.

He currently sits on the boards of UOB Bank, Far East Hospitality Asset Management, SingHealth and Integrated Health Information Systems. However, he spends the larger part of his time working with nonprofit organisations on boards and as a volunteer. He is currently a director of CHARIS, apVentures, Council for the Third Age, NTUC Health, Catholic Foundation and SymAsia Foundation.

He has written extensively on the nonprofit sector. He is author of *Doing Good Well: What does (and does not) make sense in the nonprofit world* and co-editor of *The World That Changes The World: How philanthropy, innovation, and entrepreneurship are transforming the social ecosystem.*

He is an Honorary Fellow of the Singapore Computer Society, and a Fellow of the Singapore Institute of Chartered Accountants and the Singapore Institute of Directors.

Emeritus Professor
Jean-Philippe Deschamps
IMD, Lausanne, Switzerland

Professor Jean-Philippe Deschamps is an emeritus professor of technology and innovation management at IMD in Lausanne, Switzerland. He has over 35 years of hands-on experience in innovation management.

Currently, he focuses his research, teaching and consulting activities on the management and governance of innovation and on the profile and focus of innovation leaders.

At IMD, he designed and directed IMD's highly rated programme, "Managing the Innovation Process". He was a key faculty member on "Mastering the Technology Enterprise". He was also part of the faculty of the programme, "Driving Strategic Innovation", and of IMD's High Performance Board programme. In addition, he has designed and directed specific programmes on product management, product strategy and innovation management for a variety of multinational companies.

Prior to joining IMD in 1996, he was a corporate vice president with consulting firm Arthur D. Little. He has close to 40 years of hands-on top management consulting and teaching experience with multinational corporations throughout Europe, the USA and Asia and has coached a number of start-ups. He has worked in most industrial branches.

He is the author of numerous cases, articles and book chapters and co-author of *Product Juggernauts – How Companies Mobilise to Generate Streams of Market Winners.* Professor Deschamps has authored two best-selling books: *Innovation Leaders: How Senior Executives Promote, Steer and Sustain Innovation* and *Innovation Governance: How Top Management Organises and Mobilises for Innovation.*

Speaker Biographies

Mr Scott D. Anthony
Managing Partner,
Innosight

Mr Scott D. Anthony is the Managing Partner of Innosight, a consulting and investment company that focuses on strategic transformation, disruptive change, and business model innovation. Based in Innosight's Singapore office since 2010, he also leads its Asian consulting operations and venture-capital investment activities.

He is the co-author most recently of the *Harvard Business Review* article "Build an Innovation Engine in 90 Days" as well as author of the book *The First Mile: A Launch Manual for Getting Great Ideas Into the Market* (Harvard Business Review Press, May 2014). He has authored or co-authored five other books, including *Seeing What's Next* (with Harvard's Clayton Christensen) and *The Little Black Book of Innovation*.

He is on the board of MediaCorp, a diversified media company based in Singapore, and chairs the investment committee for IDEAS Ventures.

Mr Anthony received a BA in economics, summa cum laude, from Dartmouth College and an MBA with high distinction from Harvard Business School, where he was a Baker Scholar. He has a regular column at Harvard Business Online (www.hbr.org) and tweets at @ScottDAnthony.

Mr Ang Kong Hua
Chairman,
Sembcorp Industries

Mr Ang Kong Hua is Chairman of Sembcorp Industries, a leading energy, water and marine group that is recognised for its focus on technology and innovation.

Under his leadership, Sembcorp's Technology Advisory Panel was established. The panel, chaired by Mr Ang, advises the group on technologies for research and development and investment. It also oversees the application of significant emerging technologies in the group's businesses, and ensures appropriate management of systems for intellectual property creation and protection.

A well-known corporate figure in Singapore, Mr Ang has many years of rich experience in manufacturing and services sectors, including the chemicals, electronics, engineering and construction sectors. Currently, he serves on the board of GIC Private Ltd, which manages Singapore's external reserves and chairs GIC's Investment Board which oversees GIC investment activities. Mr Ang is also director of Southern Steel Bhd.

Mr Ang was formerly Chairman of Global Logistics Properties, and previously served on the boards of DBS Bank, DBS Group Holdings and NSL Ltd.

Mr Simon Israel
Chairman,
Singapore Telecommunications
Limited

Mr Simon Israel, was appointed Chairman of Singapore Telecommunications Limited (SingTel) on 29 July 2011. He has been a director on the SingTel board since 4 July 2003. Mr Israel is also a director of CapitaLand Limited, Fonterra Co-operative Group Limited and Stewardship Asia Centre Pte. Ltd. He is also a member of the Governing Board of Lee Kuan Yew School of Public Policy and the Westpac Asia Advisory Board.

Mr Israel was an Executive Director and President of Temasek Holdings (Private) Limited before retiring in July 2011. Prior to that, he was Chairman, Asia Pacific of the Danone Group. Mr Israel also held various positions in Sara Lee Corporation before becoming President (Household and Personal Care), Asia Pacific.

Mr Israel is the former Chairman of Asia Pacific Breweries Limited, Asia Pacific Breweries Foundation and the Singapore Tourism Board. He is also a former Director of Fraser and Neave Limited and Neptune Orient Lines Limited.

Mr Israel was conferred Knight in the Legion of Honour by the French government in 2007, and awarded the Public Service Medal by the Singapore Government on National Day 2011.

Ms Koh Soo Boon
Managing Partner,
iGlobe Group

Ms Koh Soo Boon is a veteran in the global venture capital industry.

Prior to founding iGlobe in 1999, she was a corporate VC with Vertex Venture Holdings in the Singapore Technologies Group during which time she was associated with several successful companies such as Premisys Communications, Quick Logic, Quick Turn/Cadence, Brokat AG and SCM Microsystem AG. Ms Koh has achieved top quartile fund return for investors with recent exits like u-blox AG, Celestry Design System, Telenav Inc. and Aicent Inc.

A former banker with DBS Bank with diverse portfolios ranging from treasury, commercial lending to international banking and loan syndication, she is a board member of Anacle Systems, Forte Media, Sparky Animation and Verisilicon Holdings Inc. and board observer of Unity Software Inc.

Ms Koh is the Committee Member of the Singapore Chinese Chamber of Commerce & Industry and Chairperson of the Career Women Group. She is also a member of the International Women's Forum, (Singapore Chapter), Women Corporate Directors (Singapore & Shanghai Chapters) and Advisor to Swissnex (Singapore Chapter) and Committee member of Singapore Action Community for Entrepreneurship (ACE).

Speaker Biographies

Mr Lim Ho Seng is Chairman of Baker Technology Ltd and RE & S Enterprises Ltd.

He previously held directorships in companies such as Want Want Holdings Ltd, Prima Ltd and Rothmans Industries Ltd and served as the Chief Executive Officer of NTUC Fairprice Cooperative Ltd from 1994 to 1997 and General Manager since 1983.

He spent a greater part of his career on the retail industry. During his tenure at NTUC Fairprice, he was appointed a Short Term Expert by International Labour Organisation to conduct a Strategic Review on Utility Stores, an enterprise owned by the Government of Pakistan.

Mr Lim is a Fellow of the Institute of Singapore Chartered Accountants and has been awarded the Public Service Medal.

Mr Lim Ho Seng
Chairman,
Baker Technology

Mr Fredrik Härén is a Swedish entrepreneur, publisher and author. He is the founder of a creativity company called interesting.org.

He is a renowned author and speaker on business creativity. He has delivered over 1,500 presentations in over 50 countries. He was voted "Speaker of The Year" in Sweden in 2007.

He is a Certified Speaking Professional as well as a CSPGlobal (one of only 30 global professional speakers recognised by the Global Speaking Federation).

He is the author of nine books, which have sold more than a quarter of million copies in over 60 countries. His most popular book, *The Idea Book*, was included in "The 100 Best Business Books of All Time". His next most popular book, *The Developing World* examines creativity, dreams and curiosity, how businesses are being more creative, plus the pitfalls of not seeing what is going on in today's world. His latest book, *One World. One Company* is about what it means to be a "truly global company".

Mr Fredrik Härén
Founder,
interesting.org

Mr Vinnie Lauria is an entrepreneur turned venture capitalist. He is a founding partner of Golden Gate Ventures, an early-stage VC firm in Southeast Asia with over 20 investments to date. He is a Kauffman Fellow, and a guest lecturer at the National University of Singapore. He was rated by the Founder Institute as the highest startup mentor in Asia from a pool of 2,500 mentors.

Prior to setting up Golden Gate Ventures, Mr Lauria built two startups in Silicon Valley: Meetro, a location-based chat service which was dissolved in 2007 and Lefora, a forum hosting platform which grew to over 100,000 communities and was acquired by CrowdGather in 2010. He also founded the Silicon Valley NewTech meetup, featuring hundreds of startups to a monthly audience with over 10,000 members.

Earlier in his career, Mr Lauria spent four years with IBM in a variety of roles, including Product Development within IBM Research and leadership in two global IBM communities around Open Source Software and Social Networking. He was a strong promoter of social software as an asset to businesses and enterprises.

Mr Lauria is truly passionate about building startup ecosystems, and enjoys bringing the Silicon Valley spirit to other places.

Mr Vinnie Lauria
Managing Partner,
Golden Gate Ventures

Mr Dwight Hutchins is Accenture's Asia Pacific Managing Director – Strategy Consulting, Products. He is charged with helping Accenture's largest Asia-based clients improve their competitiveness and performance. Previously, Mr Hutchins was Global Managing Director of Accenture's Health and Public Service Strategy practice, helping clients around the world transform their enterprises.

Prior to Accenture, Dwight consulted with McKinsey & Company and Bain & Company focusing on marketing strategies for Fortune 500 banks and business products companies.

Mr Dwight Hutchins
Asia Pacific Managing Director,
Strategy Consulting,
Accenture

Speaker Biographies

Mr Steve Leonard
Executive Deputy Chairman,
Infocomm Development Authority
of Singapore

Mr Steve Leonard is an industry veteran with more than 28 years of experience working in leading global technology companies. In his position as Executive Deputy Chairman, he holds executive leadership responsibility for IDA, with a special focus in industry promotion and development. This includes spearheading the building of innovative start-ups and local enterprises, overseeing various national cross-sectoral programmes, technology and communications infrastructure development and the strategic planning and development of qualified professionals for the ICT sector.

Prior to joining IDA, Mr Leonard was the President of EMC Asia Pacific and Japan (APJ) where he was responsible for driving EMC's growth and market share leadership in APJ, enhancing partner and channel relationships and contributing to product-development efforts throughout the region.

Before joining EMC, he served as President of the Asia Pacific and Japan business for Symantec and Veritas. Prior to those executive management positions, Mr Leonard spent 18 years with EDS, where he focused on European and Asian operations for 12 years, ultimately rising to the position within EDS of President of Solutions Consulting for Europe, the Middle East, and Africa.

Mr Leonard currently sits on the boards of IDA Singapore, IDA International and Infocomm Investments Pte Ltd.

Mr Peter Overy
Managing Director,
IDEO Singapore

Mr Peter Overy is Managing Director at IDEO, Singapore. He is responsible for setting the strategic direction of the business in Singapore and South East Asia, pushing creative excellence across its portfolio of work and nurturing design talent across disciplines.

Mr Overy has been at the helm of major innovation projects across multiple ministries in the Singapore government; the Ministry of Manpower, Ministry of Community, Youth and Sport, and Ministry of Health. His work includes the redesign of the award-winning Ministry of Manpower's Employment Pass Service Centre, which catalysed a new approach in citizen-centred service design within the public sector. In addition to working with the public sector, he also works with private sector and multinational clients, including Eu Yan Sang and Nestlé.

Prior to moving to Singapore in 2011, Mr Overy worked in IDEO's Shanghai and London locations, where he helped design the brand and product strategy for TCL, one of China's largest consumer electronics manufacturers; and create the right ecology for innovation and new thinking to flourish at Generali, one of Europe's most prominent insurance companies.

Mr Dave Lim
Founding Director, Innovation X by Coca-Cola and TEDx Ambassador

Mr Dave Lim is a polymath, provocateur, possibilist and pioneer. He builds, launch and grow innovative startups in Coca-Cola Founders' global innovation initiative spanning over 10 countries.

Since 1996, he has worked in a diversity of professions: A venture capitalist in a $1 billion Pacific Rim and Silicon Valley fund, digital environmentalist at Earth Hour HQ, educator. Before making a leap into the start-up world during the first Internet Revolution in the 90s, he was an economist and global fund manager at the Monetary Authority of Singapore.

In 2009, Mr Lim was the founding curator of TEDx Singapore, growing this ideas community to over 50,000 people locally. He is also a global TEDx Ambassador. On weekends, Mr Lim and his wife volunteer as tour guides in Singapore's art museum. His favorite quote is by Johann Wolfgang von Goethe: "Whatever you can do, or dream you can, begin it. Boldness has genius, power and magic in it."

Ms Esther An
Chief Sustainability Officer, City Developments Limited

Ms Esther An joined City Developments Limited (CDL) in 1995 to set up the Company's corporate communications department and subsequently established the company's corporate social responsibility (CSR) portfolio.

A pioneer CSR practitioner for close to 20 years, Ms An sits on board the Singapore Compact for CSR, a local network of United Nations Global Compact, where she is instrumental in building up CDL's leadership in sustainability.

CDL is the first Singapore developer to be listed on three leading global sustainability listings, including the FTSE4Good Index Series since 2002, the Global 100 Most Sustainable Corporations in the World since 2010 and Dow Jones Sustainability Indexes since 2011. The company has also been ranked top Asian developer in the Channel NewsAsia Sustainability Ranking 2014 and conferred the Business Leadership in Sustainability Award by the World Green Building Council, among other accolades.

Speaker Biographies

Mr Liak Teng Lit
Group CEO,
Alexandra Health System

Mr Liak Teng Lit is the Group Chief Executive Officer of Alexandra Health System (Alexandra Health), which provides healthcare services for some 700,000 people living in the north of Singapore. Alexandra Health manages the Khoo Teck Puat Hospital, which began full operations in 2010. As Group CEO, Mr Liak is leading the planning and commissioning of a community hospital, a medical centre and an integrated healthcare development which are targeted for completion by 2015, 2017 and 2020 respectively.

Prior to this, Mr Liak was also the CEO of Khoo Teck Puat Hospital (2010 – 2012), Alexandra Hospital (February 2000 to July 2010), Changi General Hospital (January 1997 to January 2000) and Toa Payoh Hospital (February 1992 to December 1996). He was involved in the restructuring of major hospitals including The National University Hospital, Kandang Kerbau Hospital and Singapore General Hospital.

Mr Liak is Chairman of the National Environment Agency and also serves on the boards of Alexandra Health, NTUC Health, Pathlight School, Advisory Panel of the Singapore Human Resources Institute, Civil Service College's Service Management Advisory Panel, the Singapore Management University's Institute of Service Excellence and School of Information Systems.

Mr Douglas Foo
Founder and Executive
Chairman, Sakae Holdings Ltd

As Founder and Executive Chairman of Sakae Holdings Ltd., **Mr Douglas Foo** has led the growth and development of the group, which has since established over 200 outlets across Singapore, China, India, Indonesia, Japan, Malaysia, the Philippines, Thailand, USA and Vietnam. He continues to spearhead the overall strategic direction and management of the group's global strategic plans, and its philanthropic initiatives.

Mr Foo is the recipient of numerous illustrious accolades and awards, which are testament of his outstanding management and entrepreneurial efforts. For his achievements, Mr Foo was awarded JCS Top Outstanding Young Person Award in 2002, Rotary-ASME Entrepreneur of the Year in 2002, Singapore Youth Award in 2003, prestigious ASEAN Youth Award in 2004, International Management Action Award in 2007, Singapore Youth Award (Medal of Commendation) in 2008, WSQ Champion Award in 2010, ASEAN-China Young Entrepreneur Award in 2011 and most recently, the Public Service Star Award in 2013 from His Excellency, the President of the Republic of Singapore for his tireless efforts in his philanthropic and voluntary contributions to society. In September 2013, Mr Foo was selected to attend the prestigious Eisenhower Fellowship in the USA..

Mr Foo serves as director on numerous boards for corporate, governmental and non-profit organisations.

Mr Ray Hatoyama
Managing Director,
Sanrio Co. Ltd

After graduating from Aoyama Gakuin University in 1997, **Mr Ray Hatoyama** joined Mitsubishi Corporation (Tokyo Stock Exchange:8058). Later, he handled media contents and entertainment business operations at Avex Group (Tokyo Stock Exchange: 7860), one of the largest music companies in Japan; at Lawson, Inc. (Tokyo Stock Exchange: 2651), one of the largest convenience retail chain-stores in Japan, as well as other entertainment companies.

Since 2008, Mr Hatoyama has joined Sanrio Co., Ltd. (Tokyo Stock Exchange: 8136), and has been driving its global business. He has been managing the global marketing of Hello Kitty and expanded the iconic brand tremendously in the US and EMEA markets, taking the brand to the next level. He was appointed General Manager, Business Strategy in 2010, and is currently responsible for oversead operation and new business development.

Mr Hatoyama also serves as a non-executive board of director for DeNA Co., Ltd. (Tokyo Stock Exchange: 2432), a mobile and online service and gaming company.

He is now based in San Francisco with his wife and three children.

Mr Nobu Okada
CEO,
Astroscale Pte Ltd

Mr Nobu Okada founded Astroscale Pte Ltd in Singapore in 2013 to develop new technologies to tackle space debris issue while cultivating the passion for space exploration around the world among ordinary citizens.

Prior to this, he managed IT companies in Japan, China, India and Singapore, one of which had a successful IPO. Before joining IT industry, Mr Okada worked for McKinsey & Company and the Japanese Ministry of Finance.

Mr Okada received his Bachelor's degree in Genetics from University of Tokyo in 1995 and an MBA in Krannert School of Business, Purdue University in 2001.

Speaker Biographies

Mr Lee Poh Wah
CEO,
Lien Foundation

As Lien Foundation's first professional staff in 2005, **Mr Lee Poh Wah** transformed the Singapore family foundation into a nimble network noted for its radical approach and style.

Under his leadership, the Foundation achieved several firsts by harnessing technology and the media to move its mission. Its innovative IT initiatives raised and created new industry standards for the nonprofit healthcare and preschool sectors. Mr Lee's entrepreneurial practices in philanthropy has steered the Foundation into the global arena with its advocacy for better care of the dying. The inaugural Quality of Death Index commissioned by the Foundation as part of its Life Before Death campaign, set international benchmarks for end-of-life care across 40 countries.

Mr Lee was instrumental in setting up Lien Aid, the Foundation's international development NGO that seeks to build a firm foundation for human development through safe water and sanitation. As Lien Aid's founding chairman, Mr Lee guided its regional expansion into Cambodia, China and Vietnam. Prior to joining Lien Foundation, Mr Lee was in the civil service where he established the Social Enterprise Fund to enhance the nonprofit sector's vibrancy and financial sustainability. He also held several investment and business development positions in the private sector.

Mr Andreas Heinecke
Founder,
Dialogue Social Enterprises

Mr Andreas Heinecke is CEO and founder of Dialogue Social Enterprise, a rehabilitation programme he was initially challenged to develop for a blind colleague back in 1985. The experience, born to counter his own stereotype prejudice about disability, evolved into a social business with exhibitions in 32 countries.

A former journalist, Mr Heinecke has won various international awards. He is also the first Ashoka Fellow in Western Europe, Member of the Global Agenda Council on Social Entrepreneurship of the World Economic Forum and Global Fellow from the Schwab Foundation of Social Entrepreneurship. The serial social entrepreneur then founded TeleSign, a video-based translation service for the deaf community and later on developed the first electronic newspaper for the blind.

Mr Heinecke also holds a Professorship for the Chair of Social Business since 2011 at the EBS University, Germany.

Today, Mr Heinecke is still a driving innovator for new concepts and exhibitions aimed at overcoming stereotype mind-sets by breaking communication barriers.

Mr Robert Chew
Council Member,
Singapore Institute of Directors

Mr Robert Chew is a Managing Partner of early stage technology investors, iGlobe Partners and Stream Global. He is currently a Board Member of Alexandra Health System, Anacle Pte Ltd, Kwong Wai Shiu Hospital, Integrated Health Information Systems, Scanadu Holdings, Shared Services for Charities, and the National Council of Social Service. He was a former Partner of Accenture.

Mr Chew is a Fellow of the Singapore Computer Society (SCS), and a council member in the National Information Technology Standards Committee (ITSC), where he chairs ITSC's Cloud Computing Standards Task Force.

He was awarded SCS's IT Leader of the Year in 2009, and was conferred the Public Service Medal in 2013.

Ms Wong Su-Yen
Council Member,
Singapore Institute of Directors

Ms Wong Su-Yen is Chief Executive Officer of the Human Capital Leadership Institute; Chairman of the Board, Nera Telecommunications; and a member of the Board of Directors at MediaCorp and NTUC First Campus.

Previously she was Chairman, Singapore at Marsh & McLennan Companies and Managing Director, ASEAN at Mercer, where she led high-performing leadership teams to consistently deliver top and bottom-line growth of Mercer's business in Talent, Health, Retirement, and Investments. Recognised as a client-focused, people-oriented, and innovation-driven leader.

Ms Wong brings over twenty years' experience in business strategy, strategic human capital development, organisation transformation, operations redesign, and risk management. She has advised clients across Asia since 1995, and was previously based in the United States, Thailand, Korea, and Hong Kong.

Ms Wong is a highly-regarded speaker and facilitator at conferences, a regular commentator, and author of articles in both local and regional news media across Asia. She was also named to The Agenda Compensation 100: Top Board Candidates with Pay Setting Skills.

She is also an active member of the Young Presidents' Organisation and Women Corporate Directors.

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- **Risk management: Where lies the board?**
  Jerry Koh and Daniel Seow

- **Risk based strategies: Recognising the signals of change**
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RISK MANAGEMENT: WHERE LIES THE BOARD?

Jerry Koh, Partner and Daniel Seow, Associate, Allen & Gledhill LLP

The 2008 financial crisis has led to greater pressure on companies to have in place sound systems of risk management and internal controls to identify, evaluate and manage risk. To this end, governments of leading economies have enacted legislation and measures to rein in risk liberality, with the US Dodd-Frank Wall Street Reform and Consumer Protection Act being but one example.

In Singapore, a number of non-statutory codes and guidelines shape the best practices landscape, the primary source of which is the Code of Corporate Governance (the "Code").

The Code and risk management

The Code operates on the premise that responsibility for ensuring appropriate corporate risk management lies with the board of directors, which has, under the Code, the responsibility of establishing a framework of prudent and effective controls that enables risks to be assessed and managed.

Notwithstanding the responsibility of risk management resting chiefly with the board, Principle 11 of the Code also provides clarity with regard to the role a company's management team is to adopt on the matter of corporate risk. The board should ensure that management maintains a sound system of risk management and internal controls to safeguard shareholders' interests and the company's assets, and should determine the nature and extent of the significant risks that the board is willing to take in achieving its strategic objectives.

Board-management relationship regarding risk management

The relationship between the board and management is reasonably clear. While the board need not be involved in the day-to-day management of risk, they should adopt a risk oversight role to satisfy itself that first, the risk management systems and procedures designed and implemented by management are consistent with the company's strategic objectives and risk appetite; second, these systems and procedures are functioning as intended; and third, adequate measures are being taken to inculcate a culture of risk-awareness and risk-adjusted decision-making throughout the organisation.

The general supervisory nature of the steps required of the board does not mean that the board has a heavily diluted risk management responsibility. Guideline 11.2 of the Code states that the board should, at least, annually review the adequacy and effectiveness of the company's risk management and internal control systems, including financial,

"Under general law and the Singapore Companies Act, directors have a duty to exercise skill, care and diligence."

operational, compliance and information technology controls. Guideline 11.3 imposes annual report commentary requirements on the board. The recommendation of establishing a separate board risk committee to assist the Board in overseeing the company's risk management framework and policies (Guideline 11.4) further implies that the threshold for discharging the board's responsibilities under the Code is not low.

Another source of guidance for risk management is the non-statutory Risk Governance Guidance for Listed Boards (Risk Governance Guidance) issued by the Corporate Governance Council in 2012. It was published to provide practical guidance after the 2008 global financial crisis underscored the importance of companies taking an integrated, enterprise-wide perspective of their risk exposure. The Risk Governance Guidance is intended to be read alongside the Code and to afford more particularised content to Principle 11 of the Code.

The Risk Governance Guidance and risk management

The Risk Governance Guidance provides further detail in delineating the scope of the respective roles of the board and management. The board is to determine the company's risk policies and set directions that adequately address relevant risks by optimising risk-taking such that the company understands the risk-reward trade-off and makes a decision that is commensurate with its risk tolerance. The board should also periodically monitor the company's exposure to risk that could undermine its strategy, reputation or long-term viability. Further, the board has to ensure that management properly identifies risks relevant to the company and, where possible, put in place action plans to mitigate the risks identified, as well as provide oversight of management's risk management and internal control systems.

Correspondingly, the role of management includes the identification and management of such risks by designing, implementing and monitoring the risk management and internal control systems of the company in accordance with risk policies and directions from the board. The risk management and internal control systems should provide reasonable assurance for managing the company's risks, the safeguarding of its assets, the reliability of financial information, and compliance with laws and regulations.

On a more practical level, the following six factors should be considered in the board's deliberations in determining the company's risk management and internal control policies:
- The nature and extent of the risks facing the company;
- The extent and categories of risk that it regards as acceptable for the company to bear;
- The likelihood of the risks materialising;
- In respect of risks that do materialise, the company's ability to reduce the incidence and impact on its business;
- The risk-reward trade-off; and
- The adequacy of resources and availability of requisite experience to manage risks.

The Risk Governance Guidance also puts forth a recommended risk management process comprising five individual steps:
1. Establish context, the external context being the external business environment and the internal context being the intra-company culture and structure.
2. Identify risks, noting the difference between inherent risks (which are the risks that an event may occur assuming that no controls or risk treatment measures are implemented) and residual risks

(which are the risks that an event will occur after having taken into account any actual or proposed actions to mitigate it).

3. Analyse and evaluate risks to decide whether and which risks need to be treated and, for those that need to be treated, on the most appropriate risk treatment strategies and methods.
4. Treat the risks, with four main options: transfer the risk, avoid the risk, reduce the risk, or accept the risk.
5. Monitor and report the risks on a regular and periodic basis.

Legal position in singapore

Under general law and the Singapore Companies Act[1], directors have a duty to exercise skill, care and diligence. The duty to be skillful entails the requirement to have, at an objective minimum, a capability of understanding the company's affairs[2], while the duty to be diligent requires directors to be assiduous in the execution of their responsibilities. The standard of care and diligence expected of a director is objective, that is, whether he has exercised the same degree of care and diligence as a reasonable director found in his position[3]. Such a standard is circumstance-specific and depends on various factors such as the individual's role in the company, the type of decision being made, and the size and the business of the company[4].

A failure to institute the appropriate risk management processes may accordingly render a director in breach of the aforementioned duty to exercise skill, care and diligence. Nonetheless, the Singapore courts have exhibited judicial deference in interfering with commercial decisions taken by directors, and have articulated that judges should not, with the advantage of hindsight, substitute their own decisions in place of those made by directors in the honest and reasonable belief that they were in the best interests of the company[5]. It is therefore arguably the case that a director will be found in breach of his duties only where he has patently abdicated his risk management responsibilities.

Conclusion

While there has been no legislation or cases directly on the point of risk management in Singapore, the non-statutory codes and guidelines as well as related case law in Singapore are instructive in giving some form in this area regarding directors' duties. Case law in the other foreign jurisdictions such as the US and UK can provide a basis for comparison. Though a measure of judicial deference may be adopted by the Singapore courts, boards must nonetheless be careful to keep abreast of existing standards in the performance of their obligations, and discharge its risk management duties.

In this regard, it bears reiteration that the Code provides that boards will need to establish a structure of sound and effective risk control measures with an underlying level of acceptable risk decided upon. Boards are also expected to monitor the adequacy of the companies' risk management and internal control systems and to ensure adherence by management and other employees. ■

[1] See Section 157(1) of the Companies Act.

[2] See the Australian case of Commonwealth Bank of Australia v Friedrich (1991) 5 ACSR 115.

[3] See Daniels v Anderson (1995) 16 ACSR 607. The modern approach adopted in this case was affirmed by the Singapore High Court in Lim Weng Kee v PP [2002] 2 SLR(R) 848.

[4] See the Singapore case of Lim Weng Kee v PP [2002] 2 SLR(R) 848.

[5] See the Singapore case of ECRC Land Pte Ltd v Ho Wing On Christopher & Ors [2004] 1 SLR 105.

RISK BASED STRATEGIES: RECOGNISING THE SIGNALS OF CHANGE

Irving Low, Head of Risk Consulting, KPMG in Singapore

The board's core responsibility has always been to ensure the company's long term sustainability. To this end, boards need to keep ahead of the game: they must stay up to date with changes in the business environment, and direct the company's strategy accordingly.

Today's business environment, however, is filled with disruptive change. Rapid technological advances have upped the game with innovations such as cloud computing, big data, 3D printing or robotics. Many of the implications of these changes have yet to manifest.

Against this backdrop, developing an appropriate strategy can be tricky. Boards need to recognise that a company's long term viability is contingent on its ability to move with the times. Hence, they may wish to improve the quality of their decision making by integrating strategy with risk considerations.

Risk-based strategising

A risk-based approach to strategy involves identifying and analysing the various risks in the environment, then formulating business strategy to take them into account. This has several advantages. Firstly, it ensures that any factors potentially affecting the business's strategic objectives can be identified and managed early. This can improve decision making and resource allocation.

Risk-based strategising also ensures that the company does not treat risk management as a compliance exercise. This is pertinent in the current regulatory environment, as boards are now seeking out ways to add more value to their compliance programmes.

In addition, risk-based strategising encourages dialogue at multiple levels of the company. The board will need to bring management and operations teams up to date about any risks and/or opportunities they have identified, and gather feedback which can then be incorporated into strategy.

A risk-based strategy does not mean a disproportionate focus on risks. Boards can be assured that keeping up with disruptive trends need not involve an upheaval in the business. For example, adapting to the use of big data might begin with the simple step of training certain employees to collect and analyse information, and investing in some tools for them to do so.

Risk-based strategies also need not focus solely on risk mitigation. They may include ways for the company to take advantage of potential opportunities. For example, a company may wish to set aside a certain

> **"**At the end of the day, a company's success increasingly hinges on its ability in recognising the signals of change in its operating environment**"**

amount of resources for innovation, or have a scheme to reward considered risk taking. This would help to improve its competitiveness over the long term.

Taking the lead

Tackling large trends and changes can be a daunting task for companies that have not yet ventured out of their comfort zones. Boards are responsible for providing oversight and guidance for management, and as such, they should take the lead in improving the company's change and risk management.

The board needs to establish processes for identifying, analysing and responding to the signals of change and/ or emerging risks and opportunities. The board also needs to ensure that management understands and can implement these processes.

To this end, boards need to set the "tone at the top". They need to clearly indicate that strategy development must take change and risk oversight into account: it must be rich in relevant, timely and meaningful market research, scenario planning, and environmental scanning.

Where necessary, boards should therefore have increased dialogue with the CEO and other executives involved in strategy development and risk oversight. To reduce the likelihood of undesirable events, they should emphasise the integration of risk considerations with strategy. At the same time, to take advantage of opportunities, they should encourage the company to accept a certain amount of considered risk taking without penalising less ideal results.

Boards themselves should therefore be prepared to steer the company's strategy. They should work towards achieving a consensus on the company's future direction, and equip themselves with insights on the industry and business environment. In developing these risk-based strategies, the board should consider:
- Whether the business environment has changed significantly over the last two or three years;
- Whether the board has sufficient information about the changes;
- Whether the company's strategy has undergone change in response;
- Whether the company's culture is accepting of innovation and considered risk-taking.

If necessary, boards may also need to relook their composition to ensure that members are forward looking, prepared to handle change, and have relevant skillsets for doing so.

Working with change

The speed and volume of today's technological innovations present companies with a spectrum of new opportunities and new risks. Once widely adopted, these innovations quickly lead to new business models and new forms of competition. Some, like social media and smartphones, spawn entire industries of their own. However, such new industries can also have their dark side. The dot-com bubble of the early 1990s may be one of the best known cautionary examples.

Unsurprisingly, some companies find it more practical to ignore changes in the environment. They prefer to stick with what they know and are good at, and to focus on immediate business needs. But this may not be the most advantageous approach.

Even if a particular change might not seem relevant to a business, companies still need to remain cognisant of what is happening around them. Otherwise, the market may penalise them and they may not even know why.

For example, the boom in social media has been both boon and bane for companies. Social media is an excellent way for companies to reach out to their customers. But if not properly managed, it can backfire. It is a way for customer complaints to be widely disseminated, harming the company's image.

Another recent example is Google's decision to give search ranking priority to websites that are optimised for viewing on mobile phones. Companies that have not kept up with the increased use of mobile phones for Internet browsing may find their ability to reach customers hampered.

A potential source of competitive advantage

At the end of the day, a company's success increasingly hinges on its ability in recognising the signals of change in its operating environment, translating these signals into emerging risks and opportunities, and responding appropriately.

Whether the board chooses to interpret change as the source of risks or opportunities, they should not attempt to shut out its impact. At the least, they should seek to remain aware of wider changes in the environment so that they can adapt or, if possible, attempt to gain competitive advantage. ■

BEST PRACTICES IN ENTERPRISE RISK MANAGEMENT

Dennis Lee, Director, RSM Ethos Pte Ltd

It appears that many in the business management world still find enterprise risk management (ERM) a relatively new concept. However, its importance is often recognised even if it is not well implemented.

ERM importance

Findings from the *2015 Report on the Current State of Enterprise Risk Oversight: Update on Trends and Opportunities* by the AICPA revealed that only 23 per cent of survey participants were of the view that their organisation's level of risk management was "mature" or "robust". In addition, 65 per cent reported that they were "somewhat" or "extensively" caught off guard by an operational surprise in the last five years. This shows that in today's complex and fast changing economic, geopolitical, technological, regulatory and competitive environment, developing and maintaining an adequate and effective risk management system has been and will continue to be a challenge for organisations.

In Singapore, the annual reports of most tier-one listed companies contain extensive disclosure of the risk management framework adopted as well as the various risks identified. However, the question remains whether these risk management frameworks can stand the test of time and help organisations weather "storms" unscathed and not get caught off-guard by operational surprises. In the recent global financial crisis, we have seen reports on huge financial losses, or even the collapse of organisations that had well-written risk management frameworks and detailed risk disclosures in their annual reports.

Since the introduction of SGX Listing Rule 1207(10) in 2011 requiring company boards to give an opinion on the adequacy of internal controls addressing financial, operational and compliance risks, there have been instances where company boards have given positive opinions, yet still encounter failures in governance or liquidity management a few short months later.

> **"The question remains whether these … frameworks can stand the test of time"**

What are the missing elements that could have prevented ineffective risk management? How should companies move beyond regulatory compliance to enjoy benefits of an effective risk management system?

An effective risk management process

An effective risk management framework should have five essential practices.

First, there should be greater board engagement in risk management. In the survey, *Asia Risk Report – The Top Concerns of Asia-Pacific Risk Managers*

published by *StrategicRISK* magazine, only 29 per cent of the participants reported that risk management is integrated into every board meeting of their respective organisations. In a recent corporate governance seminar, we found only 50 per cent of participants thought that the average board had a comprehensive understanding of the risks their company faced.

This shows the board needs to be more proactive in the governance of risk. Participants also indicated risk management and value protection as the number one advantage that independent directors bring to business owners. This underscores the importance of the roles independent directors play when advocating for time and effort to building a robust risk management process.

As a rule of thumb, risk management should address the risks that would impede the achievement of strategic objectives, which is why the board and management need to review and agree on key strategic objectives that align with the organisation's mission and vision. Without clearly defined strategic objectives, the board will not be able to set the appropriate risk appetite and risk tolerance limits for the company.

Secondly, there should be engagement and clear accountability of senior executives in managing risks.

In large organisations, there is a concern that risk management may be solely delegated to a separate function instead of coming under the ownership of senior operating executives. In smaller organisations, risk management may be seen as a compliance cost and a responsibility that can be fully transferred to an outsourced professional firm. These echo the findings of the AICPA Report, where 88 per cent of public listed boards see the need for increased senior executive involvement in risk oversight.

Best practices recommend that the responsibility for defining clear strategic objectives not stop at the corporate head office at the group level. All business units – divisions, subsidiaries, departments, etc. – should be involved in defining their own objectives. This forms the basis of setting risk appetite and risk tolerance limits for each business unit which can then be reviewed and approved by the Board Risk Committee.

What this means is that risk identification, assessment, rating and mitigation plans should be developed for each business unit. All heads of department should participate in cross-functional discussions concerning risk appetite, risk tolerance, risk identification, risk profiles and risk mitigation efforts. This promotes an open risk culture, coordination and mutual understanding or appreciation of risks, and elicits ideas from the management teams of the business units as a whole.

What follows is approved risk tolerances should be translated into and aligned with management's KPIs for performance management. This ensures that the right attitude and mindset is encouraged to deal with risk. The AICPA Report similarly showed that not enough progress has been made by listed companies to incorporate measures and outcomes relating to effective risk management in determining performance compensation.

Thirdly, the risk management function should be empowered and capabilities built. Where possible, it is advocated that the risk management function be independent of the operating management with a direct reporting line to the Board Risk Committee. Unfortunately, this structure has yet to be adopted by many organisations. The *2014 Asia Risk Report survey* revealed that only 28 per cent of senior risk executives were reporting directly to the Board or Board Committee. Similarly, the AICPA Report showed that only 32 per cent of Chief Risk Officers had the same direct reporting lines.

Best practices in enterprise risk management

The risk management function should be staffed by personnel with adequate business experience as well as knowledge of the company's businesses. It should facilitate and closely monitor the risk management process undertaken by operating management in defining key objectives, risk appetite, risk tolerance, risk identification, assessment, rating and mitigation.

Finally, the various lines of defences should be well coordinated. For effective internal control and risk management, the board must be served by the various lines of defence.

The *Three Lines of Defence in Effective Risk Management and Control* by the Institute of Internal Auditors articulate this concept well; that is, the lines of defence should not operate in silos and have to work hand in glove to be truly robust in managing enterprise risks.

Operational management are the ultimate risk owners and must establish controls and effectively execute risk management and control procedures as part of daily operations. It is necessary to embed and monitor the effectiveness of the procedure through Control Self-Assessment (CSA) frameworks and organisation-wide risk dashboards. It is also necessary to establish an effective incident management framework to review and develop action plans to address incidents and near misses.

Risk management, controllership and other compliance functions that are part of operational framework need to effectively monitor the operational management in executing the first line of defence.

Internal auditors need to review the adequacy and effectiveness of the risk management processes. Annual internal audit plans should be aligned with and focus on key enterprise risks.

The road is long

There is still a long journey ahead for any company to claim it is a truly risk resilient enterprise.

Boards and key executives need to take the right first steps, invest in a culture of "doing the right thing in the right way" and foster open and frank dialogues over challenges in effective risk oversight. There is nothing more dangerous than an illusionary and false sense of comfort from an under-performing risk management function. Those charged with oversight should revisit "risk management 101" and wholeheartedly question what value and benefits they expect from risk management. ■

THE COSO FRAMEWORKS: WHY AND HOW BOARDS SHOULD CARE

Jim DeLoach and Sidney Lim, Managing Directors, Protiviti

Since it was updated in 2013, there has been a slew of literature written about the COSO frameworks.

The frameworks, developed by the United States-based Committee of Sponsoring Organisations of the Treadway Commission (COSO), were borne out of a need to improve organisational performance and governance through more effective internal control, enterprise risk management and fraud deterrence. The first two versions of the COSO frameworks were put together in 1992 and 2004.

The cause for COSO

The COSO frameworks are widely adopted by corporations and publicly -traded companies in the US, Japan and China to cover internal control over financial reporting in order to improve the accuracy and reliability of corporate disclosures and considerations for the future.

Increasingly, not just for publicly-traded companies, the COSO frameworks have been accepted as an international best practice by more and more governments. Indonesia, for example, adopted COSO as its control framework for all ministries and local administration in 2013. More recently, the US Government Accountability Office's updated Standards for Internal Control in the Federal Government (known as the 'Green Book') adapted COSO's five components of internal control principles. The good thing about COSO is its guidelines can be adopted by state, local and quasi -government entities, as well as not-for-profit organisations.

However, with the evolving and increasingly globalised business environment, there is increased expectations for competencies and accountabilities across all levels of organisations and need to prevent and detect fraud. This was the catalyst to update COSO's internal controls framework in May 2013.

Like its original 1992 version, the updated COSO framework depicts five components of internal control: control environment, risk assessment, control activities, information and communication, and monitoring. Seventeen principles drawn directly from these components add rigour to the framework with fundamental concepts. According to COSO, an organisation achieves effective internal control by determining that each of the five components and all relevant principles are in fact present and functioning in providing reasonable assurance that objectives are achieved, regardless of whether the objectives apply to operations, reporting or compliance.

The stronger emphasis on enforcing internal controls and more robust risk management and governance guidelines are a clear signal for organisations' management and the board to start caring and taking action.

> **"There is increased expectations for competencies and accountabilities across all levels"**

The COSO Frameworks:
Why and how boards should care

Boards should care

In Singapore, the *Guidebook for Audit Committees* recommends the Internal Control – Integrated Framework and notes that "the COSO Internal Control Framework is a leading framework that audit committees can consider" (Section 3.3.36 and 37).

In fact, boards, not just audit committees, should care about the COSO frameworks and their implementation.

First, boards influence the "tone at the top" in any organisation. The COSO framework emphasises the importance of this and the board's responsibility of overseeing the development and performance of internal control. While there is no doubt that the tone at the top is shaped primarily by the CEO's operating style and team's personal conduct, it is also true that directors exercise significant influence over the organisation's attitude toward risk, the aggressiveness of its policy choices and its commitment to responsible business behaviour.

Secondly, the board is responsible for oversight of the control environment. The significance of the framework is that it defines the control environment over which directors have substantial influence. The control environment ensures that the organisation acts with integrity; the board demonstrates independence from management and exercises appropriate oversight; management establishes (with board oversight) structures, reporting lines, and appropriate authorities and responsibilities in the pursuit of objectives; the organisation attracts, develops and retains competent people; and the organisation holds people accountable for results.

To ensure the board's oversight of the control environment, the framework provides that directors:
- Oversee the definition and standards of the organisation's conduct, establish expectations and evaluate CEO performance and integrity;
- Ensure, as a governing body, they have the requisite skills and are sufficiently independent to provide effective oversight;
- Provide effective challenge to executive management, as necessary, by asking tough questions regarding proposed plans, deals, and significant and unusual transactions; and
- Seek input and support from independent risk management and compliance functions, internal auditors, external auditors, and others.

A strong control environment should be a priority of the board because it lays the foundation for the organisation to position itself to be more resilient in the face of internal and external pressures.

Thirdly, the board is also responsible for oversight of the other four internal control components. For example, according to the COSO framework, the board:

- Considers internal and external factors that pose significant risk to the achievement of objectives, and evaluates and challenges management's assessment of risks inherent in new strategic initiatives. Examples include pursuing new markets or proposed acquisitions or innovating facilities and processes;
- Inquires as to the effectiveness of the design and operation of control activities in reducing risk to an acceptable level in critical areas;
- Communicates direction and tone at the top to executive management; obtains information relating to the company's achievement of objectives from both internal and external sources; reviews disclosures

to external stakeholders for completeness, relevancy and accuracy; and encourages upward communication of significant matters;

- Assesses the nature and scope of monitoring activities, any management overrides of established controls, and management's evaluations and remedy of control deficiencies.

Fourthly, internal control weaknesses matter. Directors instinctively know this. There is empirical evidence as well that:

- Strong controls reduce financial restatement risk: A 2013 Audit Analytics research report, *2012 Financial Restatements: A Twelve Year Comparison*, shows the number of restatement and non-reliance disclosures in the United States peaked in 2006, steadily declined through 2009, and has been "relatively stable" since. The required reporting on the effectiveness of ICFR was a significant contributor to this trend, as it added discipline to the control structure.

- Effective controls improve stock price: A study released in May 2006 by Lord & Benoit reported that shareholders benefit when companies have effective ICFR. To illustrate, for the two years to 31 March 2006, the Russell 3000 share index increased by 17.7 per cent. The study found that companies reporting no material weaknesses in ICFR for either 2004 or 2005 enjoyed a 27.7 per cent increase in share price. However, companies reporting material weaknesses in both 2004 and 2005 suffered a 5.7 per cent decline in share price.

The above examples apply to financial reporting controls too. When effectively designed, controls over operations and compliance add value in terms of ensuring strong quality, time, cost and innovation performance, and prevent unwanted incidents that can damage reputation.

Finally, the board needs to pay attention to the risks of management override, fraud and illegal acts. The board is the last line of defense on matters involving management overriding established controls for an illegitimate purpose, including personal gain or "cooking the books."

The updated COSO framework makes it clear that "management override" should not be confused with "management intervention," which represents overt actions management undertakes because existing controls fail to address unanticipated circumstances. Such actions are typically disclosed to appropriate personnel, whereas management override is not. The framework recommends that the board (or a board committee) oversees management's assessment of the risk of override and challenges management as circumstances dictate.

In addition, the framework states that management should assess risk in areas susceptible to fraud and illegal acts and improve controls in those areas, and the board should provide input on such assessments.

The board is considered the last line of defence. In this regard, boards would be well advised to see how the COSO frameworks can help in assessing and boosting the enterprise risk management and internal control.

Boards in Singapore will be able to receive more support in this area with the recent establishment of the Protiviti-Singapore Accountancy Commission COSO Academy, with several other partners. The Academy was formed to advocate the adoption of the COSO frameworks in Singapore. ■

GETTING MORE OUT OF AUDITS WITH ANALYTICS

Max Loh, Managing Partner, EY in ASEAN and Singapore

With rapid advancement of technology and digitisation, traditional audit will no longer serve its purpose. The risks and opportunities that result from this paradigm shift are already impacting how boards and Audit Committee (AC) members discharge their oversight responsibilities of a company's financial reporting and disclosure, how audits are conducted and putting into question the kind of purpose audits serve.

The future of audit is now

The audit of the future will bear little resemblance to the traditional audit that the board, AC and management are accustomed to. Not only will the way organisations conduct audits will revolutionise in the next five to 10 years, external auditors will be expected to bring more value to the table.

Even with changes abound, the core approach to an audit is fundamentally the same. Auditors have been using analytics in their methodology for years, but rapidly decreasing technology storage and processing costs are making data analysis commercially viable at a much greater scale and depth. And external auditors who can successfully deploy techniques that incorporate data analytics into an audit will quickly be seen as trailblazers.

Going big with data

Auditors will be able to examine much larger sets of financial data beyond current sampling techniques to better identify issues, anticipate risks and analyse trends. Using data analytics, auditors will be able to move beyond financial compliance-based work to go over trends in areas like potential fraud, transaction errors, anomalies in data and breakdown of controls.

As a result, they will be able to provide greater confidence and deeper perspectives to the management, who can then offer better forward-looking perspectives to boards and ACs and sharpen decision-making.

At the same time, such transformation in audit also improves audit quality, answering regulators' call for a continued focus on the quality of audit work and audit evidence, and higher levels of professional skepticism.

However, making the transition from traditional audit to the audit of the future will not be an overnight affair. Organisations will need time to move towards a more comprehensive audit that considers such areas as fraud and financial risk and compliance, even as audit firms embed modern technology and data analytics into its auditing procedures.

> " … Such transformation in audit also improves audit quality, answering regulators' call for a continued focus on the quality of audit work and audit evidence… "

For now, the chief financial officers should explore with their auditors on how they can leverage new analytics and technologies that may enhance dialogue with senior management and provide deeper insights. It is also timely that boards and ACs starting questioning if their organisations are maximising the potential and value of audits, and where do they begin on this journey of audit transformation.

Key considerations for boards and ACs

To determine the starting point, first and foremost, it is important that boards and ACs develop a better understanding of how analytics is being used in the audit today. In general, organisations use data analytics for three purposes: hindsight, insight, and foresight.

Hindsight refers to historic data, where most traditional analysis is focused. Insight refers to the provision of real-time information, such as how online retailers push products based on the items in an online shopper's cart. Foresight is predictive and refers to anticipating behavior and needs.

It is important to understand the potential barriers to the successful integration of data and analytics into the audit. For example, one of the challenges is the quality of data available. Embracing big data will mean obtaining sub–ledger information for key business processes. This increases the complexity of data extraction and the volumes of data to be processed. Moreover, there could be hundreds of different accounting systems and multiple systems within the same company, all containing different sets and types of data. Also, in some cases, organisations may refuse to provide data, citing security concerns.

Suffice to say that when the capturing and managing of data fails, the analysis of the said data will at best be limited. There thus must be a commitment at the top to ensure that IT and other functions are taking steps to ensure that data is of quality and enable the auditors to streamline data capture.

Secondly, boards and ACs need to understand how internal audit and compliance functions are using data and analytics today, and the management's future plans. These techniques can have a significant impact on identifying key risks and automating the monitoring processes for compliance and risk.

As with any investments, the success of data and analytics will be determined by the human element. In many cases, internal audit may already be constrained by the company's investment – or the lack of – in the right level of resources. Therefore, it is crucial that boards and ACs drive competency development as a third area of focus, where it should go beyond developing technical competencies to create the necessary analytical mindset within the finance, risk and compliance functions so that they can leverage the analytics produced effectively.

To sum, it is crucial before subsuming data analytics into audit that boards and ACs answer these questions:
- What parts of the business are responsible for data analytics at your company?
- Do you know how your company compares to others in its data analytics capabilities?
- Has your company moved beyond hindsight analytics to insight or foresight analytics?
- Where does internal audit fit in the company's use of data analytics?
- How does your audit firm plan to use data analytics in the external audit?

Towards governance and business resilience

Clearly, moving from a traditional audit to one that fully integrates data and analytics in a seamless manner is a massive paradigm shift for the audit profession and a major transformation journey for organisations and their leaders.

Boards and ACs that embrace the audit of the future – and its potential to transform the entire audit process – will be helping their organisations to adopt a more resilient business strategy and enabling themselves to deliver on their governance responsibilities more confidently than ever before. ■

The views reflected in this article are the views of the author and do not necessarily reflect the views of the global EY organisation or its member firms.

ESTABLISHING AN EFFECTIVE INTERNAL AUDIT FUNCTION

Koh Chin Beng, Partner, Risk Advisory Services, BDO LLP

Establishing an effective internal audit function is hardly a revolutionary topic. Most, if not all, would agree that internal audit has a higher chance of success when it is structured on an organisation's risks and needs.

It is widely accepted that internal audit serves as the third-line of defence within an organisation's internal control framework. It provides independent, objective assurance and advises on activities that improve an organisation's operations. Further, it adds value to the board of directors and senior management, who are positioned as the first-line of defence.

Internal audit, by convention, offers compliance and periodic audit on operations. However, such limited scope is no longer sustainable in today's business environment. To further enhance its relevance and value, internal audit needs to be involved in enterprise risk management, fraud, cyber security and information technology security assessment. Risk management is forward-looking as compared to compliance, where reviews are performed on past activities.

It is also in the board's interest to push for internal audit to incorporate strategic and emerging business risks reviews in its scope. This is besides its contribution to good governance, which has been given heightened emphasis of late, along with corporate responsibility and accountability.

As key strategic issues are sometimes overlooked, it is best that when establishing an internal audit division, the strategy must drive the tactics. It is useful to look at cases where there have been internal audit-related shortcomings. Some key weaknesses found in SOX Section 404 internal control reports are: lack of a comprehensive or effective internal audit programme/function; lack of independence in the internal audit function; staffing problems and inexperienced internal auditors.

Going beyond compliance

We increasingly see stakeholders asking, if not demanding, internal auditors to address strategic and emerging business risks. The Institute of Internal Auditors (IIA)'s *The Pulse of the Profession 2014* identifies strategies for advancing internal audit in a report titled *Enhancing Value Through Collaboration: A Call to Action.* The report examines changing expectations from key internal audit stakeholders based on the findings of four major industry surveys conducted in the first half of 2014.

A mutual set of actions to accommodate this changing landscape of internal audit is necessary. It takes two hands to clap after all. For a start, internal auditors need to manage expectations with their primary stakeholders, i.e.,

> " As key strategic issues are sometimes overlooked, it is best that when establishing an internal audit division, the strategy must drive the tactics. "

Establishing an effective internal audit function

the board, the audit committee (AC) and senior management, and structure their activities accordingly. The board, on the other hand, needs to encourage internal auditors to go beyond mere compliance audits and develop an increased focus on business value-added reviews.

Communication is key

A clear and open communication between both parties would help bridge the needs and expectations of the internal auditors' primary stakeholders. It is essential for the board and senior management to keep the internal auditors updated with key developments concerning the company's business and strategic plans. To be highly regarded by the top management internal auditors need to develop effective communication process outside of the scheduled audits.

Moreover, the board needs to provide the internal auditors with a mandate of an appropriate authority and of an applicable structure that supports its enlarged scope, besides independence and objectivity. The mandate which is typically set out in a written charter must be compatible with the charter of the AC and consistent with the standards of IIA.

Getting the right balance

To evolve from a function primarily focused on financial risks to one that covers a broad spectrum of risks, internal audit has to recruit staff with more diverse backgrounds and work experiences. Organisations are also increasingly more global than before. At the same time, the board (or the AC) has to play its role too. Having provided the mandate, the board (or the AC) should also be critically reviewing the composition of the internal audit function.

Internal audit's value proposition is only as good as the skills the function brings to the organisation. There has to be a right blend of capabilities or each of the internal audit assignments. Nonetheless, it has proven to be a challenging exercise. It depends on the availability of resources to form a team which is well-informed on the local rules and regulations paired with business acumen.

One option for the board is to look internally to supplement the internal audit function. Experienced employees with specialised skill sets are an asset as they are familiar with the organisation's operations, structure, culture and internal control environment.

Organisations could consider secondment of these experienced staff to the internal audit team, either on a project basis or for a period of time. For such an arrangement to be successful, appropriate on-the-job training for experienced staff is required to fill in the gaps of internal audit methodology. The board should be mindful of the potential downside of this arrangement, i.e., the secondee cannot be involved in auditing the area that they worked in. Consequently, the board needs to ensure proper structure in place to maintain objectivity and to avoid any possible perception of conflict of interest.

Establishing the suitable internal audit setup

Strengthening the internal audit function via secondment is not a sustainable solution in the long run. The board may explore the option of co-sourcing or outsourcing internal audit arrangement. Multinational companies and

government bodies tend to recruit an in-house team of internal auditors due to the size of operations as well as the number of rules and regulations to be complied with. However, even for these organisations, it remains a perennial challenge to recruit and form an internal audit team that can deal with diverse risks and subject matter expertise. Outsourcing or co-sourcing internal audit arrangement can help an organisation attain flexibility and reduce costs by complementing existing personnel and providing access to variable skill sets.

Some common types of co-sourcing or outsourcing audits are information technology, enterprise risk management, human resources and payroll audits. The primary rationale for such an arrangement ranges from being a cost efficient solution to protecting a company's sensitive information. Furthermore, there is also a strong demand for specialisation and expertise in enterprise risk management.

Although the board is not expected to be thoroughly well-informed about risk management, they should be aware of the risks and understand risk management. Particularly because enterprise risk management implementation is still at its infancy in the business world of Singapore. Hence getting an external service provider would reap strategic value. Organisations with limited in-house specialists could also tap on internal audit firms.

The price tag

As stewards of the organisation, the board rightfully has to get their bang for the buck. There is no simple answer or formula to determine the internal audit budget. The budget should be driven by the complexity of risks an organisation faces.

There are some crucial factors when planning the budget. Besides the internal audit plan and the scope of work, it should factor in employee competency and the availability of resources and the maturity of risk management. The organisation needs to ensure that its audits are performed efficiently and at a high quality as much as possible.

Not unlike any other business

The board plays a critical role in establishing an effective internal audit function.

Change is constant, and the evolution of internal audit is no exception. An internal auditor needs to constantly communicate with his/her stakeholders to ensure that he/she is focusing on areas of concern. Internal audit is often regarded as an extended arm of the AC to conduct adhoc and routine internal control review in order to discharge AC's oversight responsibilities in risk management and internal control.

A progressive board will also engage internal auditors to focus on business value-added reviews to address strategic and emerging business risks. This requires the board (or the AC) to right-size the internal audit unit based on the organisation's risk profile. The internal audit division's human capital strategy should reflect its mission, role and required competencies.

Lastly, the key is to note that internal audit is agnate to any other business process. Its performance and value contribution can be measured if clear value drivers have been established at the start and effective measurement protocols are developed. Look beyond the organisation to identify leading practices that can improve process of internal audit performance. ■

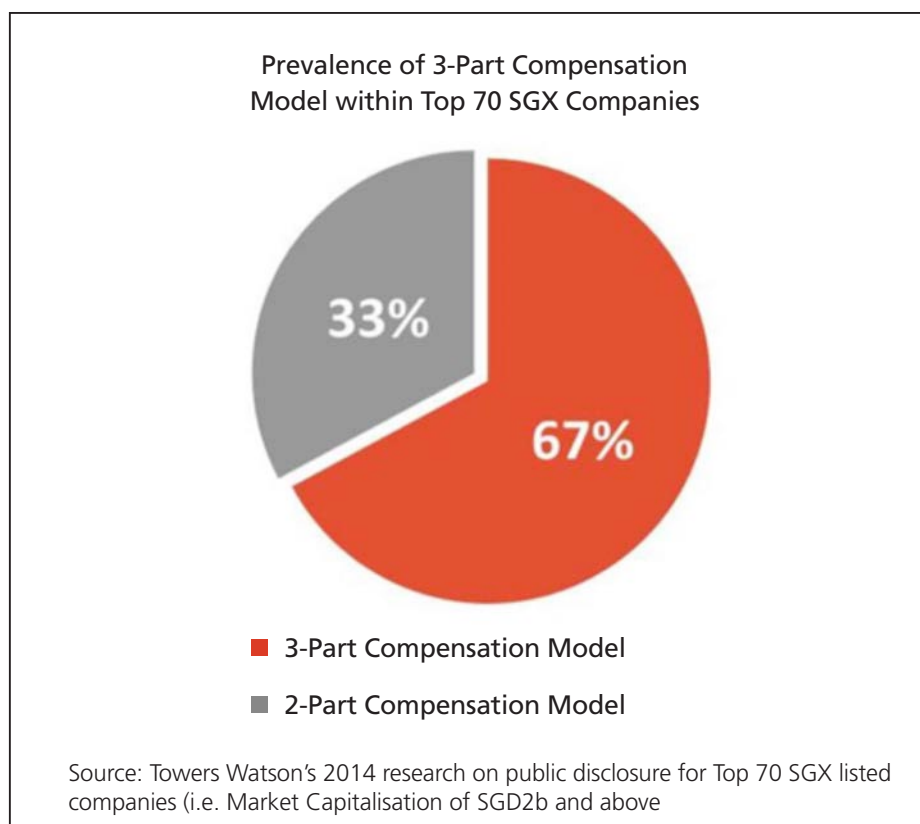# ARE YOU PROVIDING THE RIGHT PAY PACKAGE FOR YOUR C-SUITES?

Tan Yong Fei, Senior Consultant, Executive Compensation, Towers Watson South East Asia

Singapore, through its Code of Corporate Governance, encourages companies to provide long term incentive schemes for directors and management that are aligned with the firm's long term interests and risk policies to attract, retain and motivate talent – without paying excessively.

3-part compensation model

Increasingly, a three-part compensation model pegging compensation to a firm's long-term financial performance is becoming the norm. In addition to basic pay and the annual bonus, the trend now is to include as executive compensation, a third variable component dependent on the firm's financial performance over a multi-year period.

Towers Watson's research on public disclosure for Top 70 SGX listed companies shows that around two-thirds of these companies have adopted this compensation model in 2014.

Prevalence of 3-Part Compensation Model within Top 70 SGX Companies

33%

67%

- ■ 3-Part Compensation Model
- ■ 2-Part Compensation Model

Source: Towers Watson's 2014 research on public disclosure for Top 70 SGX listed companies (i.e. Market Capitalisation of SGD2b and above

> **"**Increasingly, a three-part compensation model pegging compensation to a firm's long-term financial performance is becoming the norm.**"**

Long-term incentive plans

However, deeper insights would reveal that a significant number of them (37 per cent) have approved Long-Term Incentive (LTI) plans but do not utilise them. This could be due to lack of experience, bad experience, or cost concerns and dilution concerns (for equity-based LTI). In Singapore,

performance share plans are typically linked to market-based metrics such as absolute and relative total shareholder return. There are also restricted share plans which are usually linked to operational metrics.

One application of long-term compensation is when a loss-making firm that cannot afford to pay bonuses wants to retain and motivate key executives. The company can provide an employee share option scheme with vesting condition subject to the company regaining profitability. The accounting expense can be reversed if the company underperforms.

This approach was used by a publicly listed company in the food manufacturing and distribution business. The company's financials were on a downward trend with losses incurred in a recent financial year. Retention of key executives was crucial to ensure proper execution of the turnaround strategy.

A second application is in the incentive plan for a fund management company using total shareholder return as a metric. The company wanted to align its fund manager's compensation to the fund's performance instead of the parent company. It was decided to use phantom share grants with an initial price set using Net Asset Value per share. The performance metrics included three-year cumulative net profit after tax growth target (in terms of fund management fees collected), net third party injections (raised from investors) as well as change in market value of the fund between vesting and grant of the phantom shares.

Pay mix

From a pay mix perspective for top executives, we expected at least a 50 per cent: 50 per cent mix of fixed versus variable compensation. This was validated by data for SGX's top listed companies as more than 50 per cent of CEO and C-suite's total compensation is provided in variable components (denoted by STI and LTI).

However, the focus on STI or annual bonus has always been lopsided relative to LTI. This may suggest that heavier emphasis is being placed on short-term performance at the expense of longer term performance.

3-Part Model

Base Salary ■ STI ■ LTI

	Base Salary	STI	LTI
CEO	32%	42%	26%
Non-CEO	44%	35%	21%
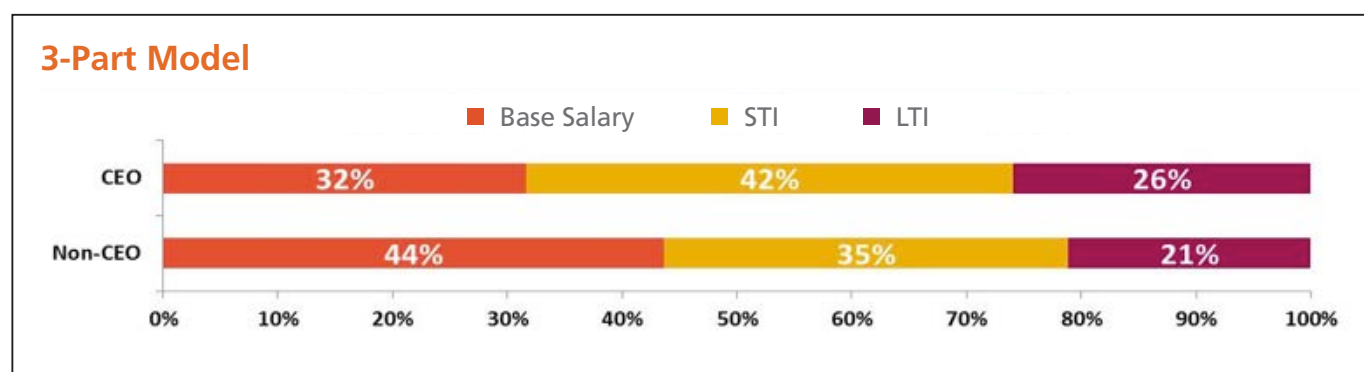
Are you providing the right pay package for your C-Suites?

Pay for performance

Finally, we analysed the performance of all SGX listed companies over a three-year period to find out if companies who have active LTI plans do actually outperform those who do not.

Indeed, the results were as expected. Companies with active LTI plans outperform those who do not by a significant 7.7 per cent p.a. on Total Shareholders Return.

While there are many other factors that may have contributed to the outperformance of these companies, there is reason to believe that an appropriately designed and well executed LTI plan is one of the key drivers of a companies' longer term success. ■

Source: Towers Watson's 2013 research on public disclosure
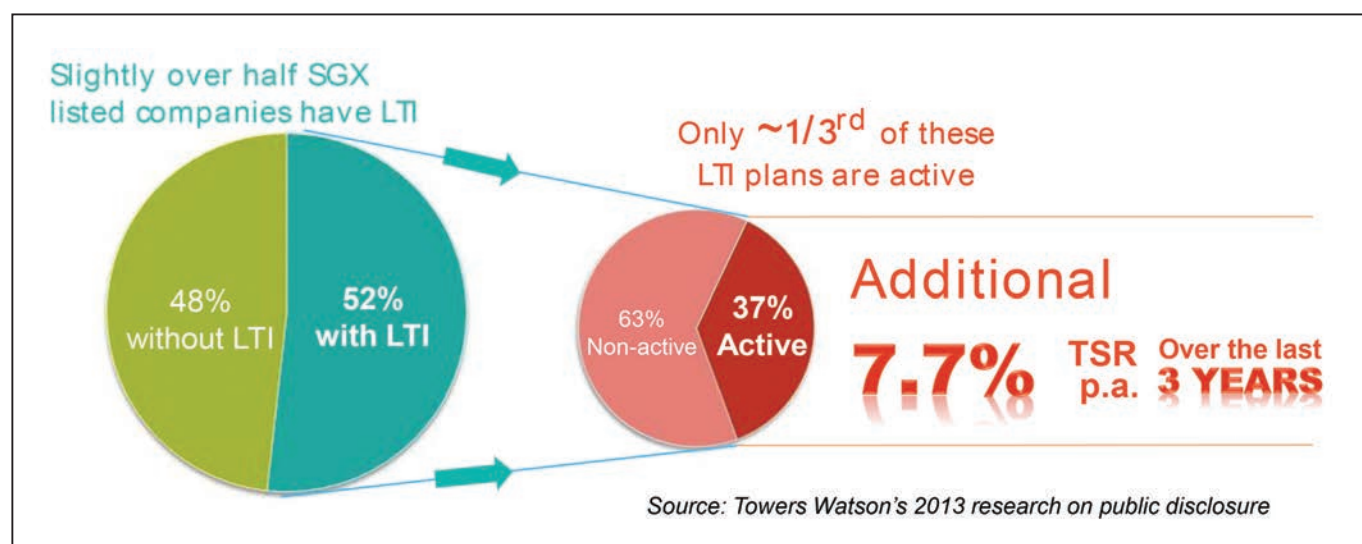
SECTION
FOUR

Readings: Innovation in General

HARNESSING TECHNOLOGIES FOR INNOVATION

Philip Lim, CEO, A*STAR ETPL

In its June 2015 issue, the *Harvard Business Review* (HBR) reported that "without an innovation strategy, innovation improvement efforts can easily become a grab bag of much-touted best practices: dividing R&D into decentralised autonomous teams, spawning internal entrepreneurial ventures, setting up corporate venture-capital arms, pursuing external alliances, embracing open innovation and crowdsourcing, collaborating with customers, and implementing rapid prototyping, to name just a few".

An innovation strategy, according to HBR, is part technological innovation and part business model innovation. On that note, just how can local enterprises leverage the Singapore research ecosystem to grow their business?

Outcome-driven innovation

Governments all over the world have recognised that technological innovation can be a huge creator of economic value and a driver of competitive advantage. In a study undertaken by Singapore's national research agency A*STAR in 2013, it was ascertained that many countries are focusing on improving their Research, Innovation, and Enterprise (RIE) ecosystems in order to achieve economic growth and create good jobs. Even countries that traditionally focused on research excellence, such as the UK, have now placed a greater emphasis on the translation of public sector R&D for economic impact, and have set up or are evaluating the possibility of an entity to facilitate the translation.

Against this backdrop, mission-oriented research performers – such as Tekes and VTT in Finland and TNO in the Netherlands – play an important role as intermediates to translate research capabilities from laboratory to industry. In Switzerland, the Universities of Applied Sciences (UAS) act as intermediate performers to promote innovation and knowledge transfer. The UAS sector was created in 1995 with the aim of supporting SMEs. The Applied Sciences campuses in New York are similar to Switzerland's UAS, with the mission to act as intermediates in generating high-tech spin-offs and high value-added jobs. The presence of such dedicated intermediate performers facilitates more thematic, concentrated, whole-of-nation efforts to direct research to support industry clusters.

In line with the global trend, Singapore's R&D landscape has expanded strongly in the last decade with growth in the number and diversity of research performers. Starting with pockets of R&D capabilities residing in research institutes and the universities, Singapore has now established an emerging and vibrant R&D ecosystem comprising a greater diversity of research performers, including public sector research institutions (A*STAR),

> **"**Business growth is driven by the successful translation of innovative ideas into products, services, solutions and processes.**"**

institutes of higher learning (IHLs), hospitals and academic medical centres, and corporate R&D laboratories. In the same period, our local universities have also transformed into more research-intensive institutions.

With many of the building blocks of a sustainable and robust RIE system in place – including a high-level political commitment to research and innovation, platforms for inter-agency coordination, a strong education system, research institutes that facilitate public-private partnerships, etc. – Singapore is seeking to reap greater economic benefits from our investments in R&D. At the same time, a slower-growing workforce makes it all the more important for every enterprise to innovate to create more value, and to maximise the potential and performance of every worker.

Leveraging public-sector R&D

In gearing local enterprises for the next stage of growth, there is a critical need to expand their innovation capacities and facilitate their access to useful technologies.

In terms of business expenditure on R&D, one significant macro shift in recent years is how companies seek to maximise their R&D investments. As a result, more companies are moving away from completely in-house R&D and leveraging public-sector R&D performers under an open innovation framework. Industry engagement with research performers take many forms; at A*STAR, industry engagements range from one-to-one partnerships / projects to many-to-many consortia (refer to diagram below).

Harnessing technologies for innovation
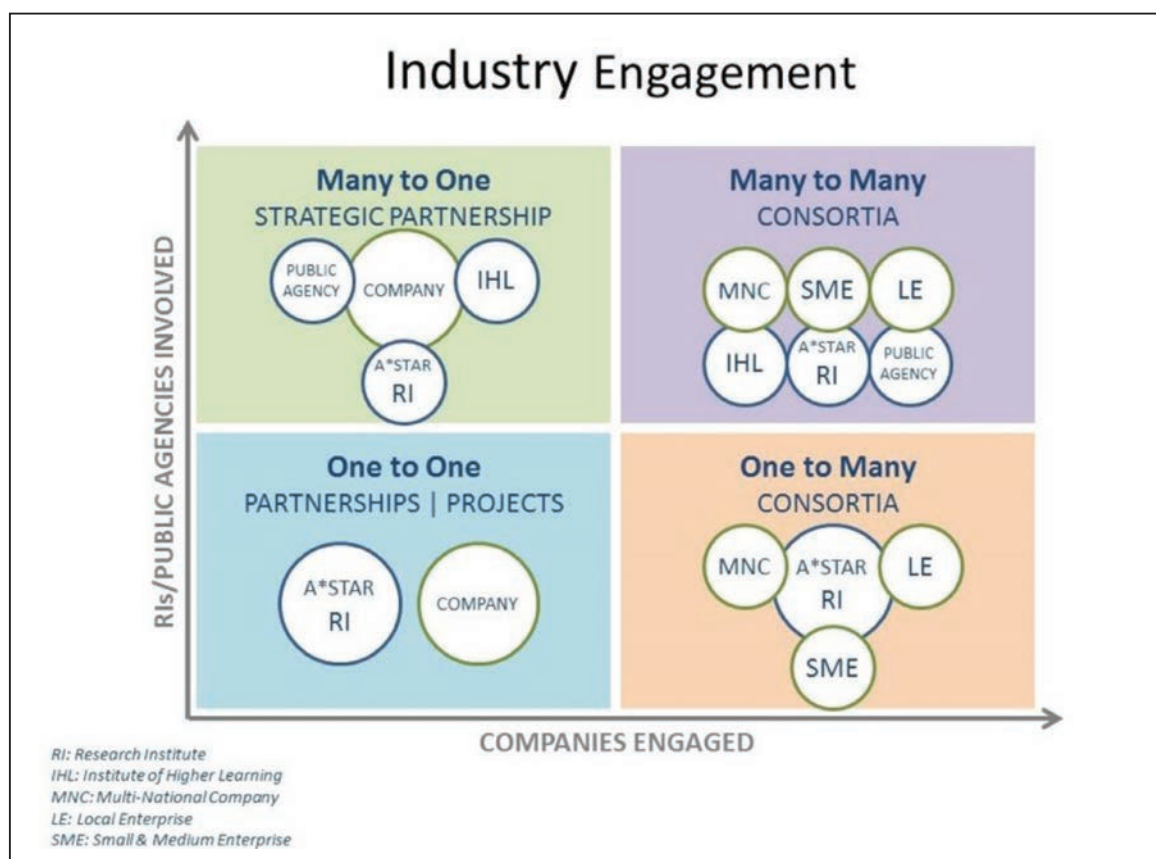
ETPL, as the commercialisation arm of A*STAR, is a one-stop resource for local enterprises looking to harness the potential of new technologies as a competitive strategy. Managing a portfolio of more than 3,400 active patents and applications resulting from A*STAR research, ETPL has granted over 1,000 licenses – mostly to local companies – for technologies, with an expected commercial value of over $600 million. These include the SARS detection kit, slip-resistant glass, a screen protector that transforms your mobile devices into a portable 3D screen, and putting DNA on a silicon chip.

Example of research-industry collaboration

In April 2014, A*STAR initiated a Collaborative Industry Project (CIP) on Roll-to-Roll Manufacturing of Functional Film and Printed Electronics to help companies strengthen their technological capabilities in this fast-growing industry.

CIPs provide a cost-effective R&D alternative to the traditional capital-intensive research methods and materials. It is a platform where groups of companies with similar issues work with A*STAR to develop manpower and technology. The CIP at A*STAR's Singapore Institute of Manufacturing Technology (SIMTech) saw participation by 7 SMEs and 5 MNCs engaged in advanced inkjet and printing equipment, surface coatings, nanomaterials and interconnecting materials.

Over the 18-month collaboration, the participating companies would master roll-to-roll manufacturing through knowledge and technology transfer by SIMTech to enable them to participate in the growing applications of printed electronics. The global printed electronics market, according to the *2013 IDTechEx report*, is estimated to grow to US$76 billion (S$104 billion) in 2023 from US$9.4 billion (S$12.9 billion) in 2013.

Upon completion of the CIP in September 2015, a supply chain is created, paving the way for businesses to venture into these new opportunities.

For MNC Cima NanoTech, one of the CIP participants, the opportunity to work closely with other consortium members, researchers and engineers in the supply chain allows the material supplier to speed up its new applications development process.

Another participant, local SME Film Screen Pte Ltd, which specialises in printing solutions for outdoor advertising, has discovered a new revenue stream. It has signed a two-year, non-exclusive license with ETPL to use the roll-to-roll large area processing technology for advertising applications. It launched the breakthrough lighting film technology, eLumiNEX™, on SMRT bus service 190 in May, catching the attention of shoppers on Orchard Road. Film Screen aims to deploy printed lighting for illumination of large-format advertising on multiple SMRT buses by year end.

A valuable resource

Business growth is driven by the successful translation of innovative ideas into products, services, solutions and processes that meet the challenges of changing user needs and new competition. However, as management guru Peter Drucker pointed out, no one in an age of rapid change can possibly hope to produce all the technology that is needed, not even in one's own area.

For enterprises seeking to innovate, therefore, public sector research performers can be a valuable resource. Through ETPL, A*STAR proactively engages industry at various stages of the research and commercialisation continuum to facilitate knowledge and technology transfer in both directions, as well as to ensure better alignment between upstream research and downstream commercialisation efforts.

In today's business battleground, innovation may be a company's best secret weapon. ■

THE JOURNEY TO INTEGRATIVE INNOVATION

Calvin Chu, Managing Partner, Eden Strategy Institute

Just as some of us are waiting to see the rise of the next Singapore-owned billion dollar start-up or global CEO extraordinaire, many local organisations are already blazing the trail, producing and championing a type of innovation seemingly unique to Singapore.

And it is ubiquitous – starting with the "Singapore story": a deliberate, coordinated design of our education system, social policies, political structure, and economic strategy that has been instrumental to Singapore's modern success in the past 50 years.

It is from this "integrative innovation" that our very own brand, Singapore Airlines is borne. The airline's meteoric rise from a mere startup to a world-class organisation lies partly in its competitive advantage: from the strategic alignment of its premium market position, flight routes to staffing policies and in-flight experience.

Another standout example is the Kallang River-Bishan Park project. It applied fluid mechanics, bioengineering, soil analysis, landscape architecture, sensor technologies, materials studies and policy transformation to store freshwater, reduce flood, grow biodiversity, and improve park features.

Another example of local innovation is the creation of a pervasive transport cum payment ecosystem. The use of contactless smart cards (Cashcard and EZ-link) that enables various transport means including bus, MRT, electronic road tolls, electronic car parking must surely be a world's first. In addition, the Cashcard has become a ubiquitous handy debit card for almost all forms of retail.

Diverse as these examples are, one thing they have in common is their ability to combine complex, system-level opportunities (e.g. ageing) with related issues like healthcare, employment, social policy and urbanisation, to positively impact economic development and the environment.

Akin to social innovations, integrative innovations often adroitly leverage on untapped markets by addressing the multiple dimensions of a particular issue to meet the needs of various stakeholders. The essence of integrative innovation may be found at the intersection of different industries, disciplines, and countries.

> **"…many local organisations are already blazing the trail, producing and championing a type of innovation seemingly unique to Singapore."**

Towards this end, the Eden Strategy Institute has developed a series of infographics on various emerging industries and opportunities:
- Neuroengineering
- Space
- Urban Technologies
- Wearable Devices
- Corporate Social Innovation

We hope that a review of these diverse emerging areas will help spur groundbreaking discussions and ideas that will be relevant to your organisation and its continued success. ■

Recent advances in
NEUROENGINEERING

Facts about the Human Brain

2 %
Brain's weight compared to total body mass

86 bn
Neurons in total

100 K
Chemical reactions per second

20 %
The body's oxygen and blood used by the brain

200
Spikes per second per neuron

20 W
Electricity generated; enough to power a light bulb

Neuroengineering methodologies

Systems neuroscience
Modeling neural maps at the anatomical, cellular, genetic, and molecular levels

Neuroimaging
- fMRI
- CT
- CAT
- PET, etc.

Identifying parts of brain activated for different tasks

Microsystems
- Transcranial magnetic stimulation
- Electrical stimulation
- Neuropsycho-pharmacology, etc.

Delivering electrical, chemical, magnetic, and optical signals to brain to stimulate responses

Brain-computer interface
- Galvanic skin response
- Deep brain stimulation
- Optogenetics, etc.

Systems that communicate with the brain, such as to deliver instructions to neuroprosthetics

Neurofeedback
- fMRI
- EEG
- HEG, etc.

Teaching self-regulation of brain functions

Neural regeneration
- Gene therapy
- Stem cell
- Viral/transgenic
- Tissue engineering
- Nanotechnology, etc.

Restoring function to damaged tissue

Emerging Applications

Medicine
Rehabilitation for ADHD, depression, Parkinson's, trauma, etc.

Education
Adaptive learning styles for better attention, memory, and cognition

Gaming
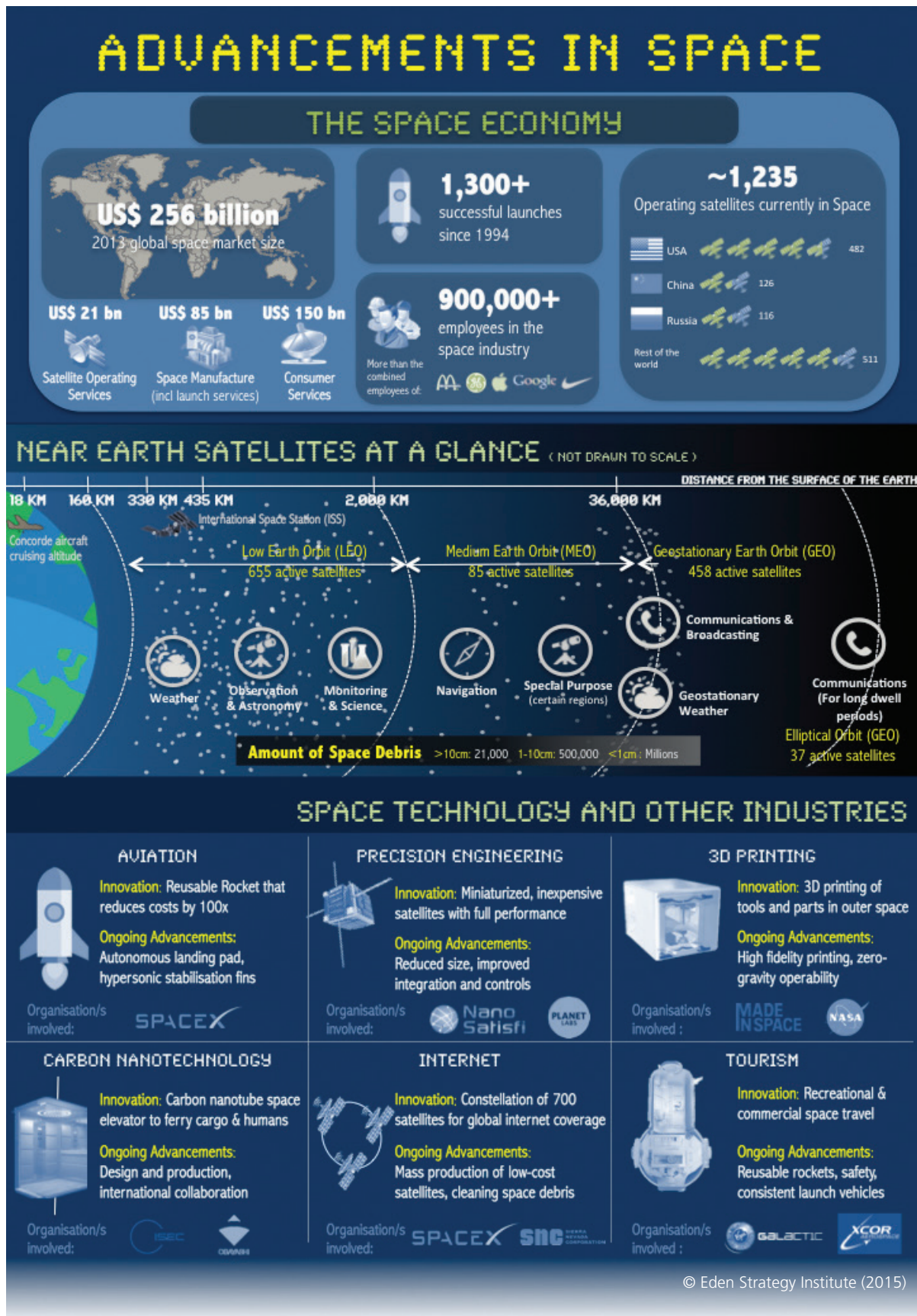Develops teamwork, problem solving, and spatial skills

Neuro-economics
Improved decision-making

Human enhancement
Controlling stress levels, cognitive performance, prosthetics, robotics, etc.

ADVANCEMENTS IN SPACE

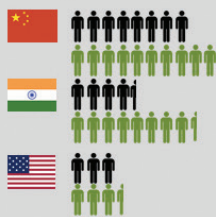## THE SPACE ECONOMY

US$ 256 billion
2013 global space market size

US$ 21 bn
Satellite Operating Services

US$ 85 bn
Space Manufacture (incl launch services)

US$ 150 bn
Consumer Services

1,300+
successful launches since 1994

900,000+
employees in the space industry
More than the combined employees of: M, GE, Apple, Google, Nike

~1,235
Operating satellites currently in Space

- USA — 482
- China — 126
- Russia — 116
- Rest of the world — 511

NEAR EARTH SATELLITES AT A GLANCE (NOT DRAWN TO SCALE)

DISTANCE FROM THE SURFACE OF THE EARTH

| 18 KM | 160 KM | 330 KM | 435 KM | 2,000 KM | 36,000 KM |

Concorde aircraft cruising altitude

International Space Station (ISS)

Low Earth Orbit (LEO)
655 active satellites

Medium Earth Orbit (MEO)
85 active satellites

Geostationary Earth Orbit (GEO)
458 active satellites

- Weather
- Observation & Astronomy
- Monitoring & Science
- Navigation
- Special Purpose (certain regions)
- Communications & Broadcasting
- Geostationary Weather
- Communications (For long dwell periods)

Elliptical Orbit (GEO)
37 active satellites

Amount of Space Debris >10cm: 21,000   1-10cm: 500,000   <1cm : Millions

SPACE TECHNOLOGY AND OTHER INDUSTRIES

AVIATION
Innovation: Reusable Rocket that reduces costs by 100x

Ongoing Advancements: Autonomous landing pad, hypersonic stabilisation fins

Organisation/s involved: SPACEX

PRECISION ENGINEERING
Innovation: Miniaturized, inexpensive satellites with full performance

Ongoing Advancements: Reduced size, improved integration and controls

Organisation/s involved: Nano Satisfi, PLANET LABS

3D PRINTING
Innovation: 3D printing of tools and parts in outer space

Ongoing Advancements: High fidelity printing, zero-gravity operability

Organisation/s involved : MADE IN SPACE, NASA

CARBON NANOTECHNOLOGY
Innovation: Carbon nanotube space elevator to ferry cargo & humans

Ongoing Advancements: Design and production, international collaboration

Organisation/s involved: ISEC, OBAYASHI

INTERNET
Innovation: Constellation of 700 satellites for global internet coverage

Ongoing Advancements: Mass production of low-cost satellites, cleaning space debris

Organisation/s involved: SPACEX, SNC SIERRA NEVADA CORPORATION

TOURISM
Innovation: Recreational & commercial space travel

Ongoing Advancements: Reusable rockets, safety, consistent launch vehicles

Organisation/s involved : GALACTIC, XCOR

ADVANCEMENTS IN URBAN TECHNOLOGIES

GROWING POPULATIONS CREATE NEW DEMANDS OF CITIES

2014 | 2030

URBAN POPULATION	CO2 EMISSIONS	ELECTRICITY CONSUMPTION	WASTE GENERATION
= 100 mn people	= 1 Gt CO_2/ yr	= 500 kWh/ capital/ year	= 100,000 tons/ day

East Asia & Pacific

South Asia

Latin America & Caribbean

EMERGING TECHNOLOGIES IN THE SUSTAINABLE CITY

- Solar tiles
- Individualized electric vehicles
- Rooftop farms
- Rainwater purifier
- Smart solar PV walls
- Suburbanization
- Dynamic incentives
- Interactive bus stops
- Composting & Biogas
- Traffic sensors
- Open alert systems
- Co-working spaces
- Last-mile solutions
- Smart solar roads
- Distributed wind turbine
- High-speed bullet trains
- Citizen feedback
- Vehicle sharing
- Driverless Cars
- Urban air purifiers
- Storm-water collection park
- Flywheel battery
- De/centralized building command (HVAC)

INNOVATION STRATEGIES WHEN CONNECTING URBAN TECHNOLOGIES

OPEN GOVERNANCE

Governments leverage citizen participation and collaboration through feedback systems to increase managerial efficiency and accountability

SHARED ECONOMY

Entrepreneurs unlock underused assets by making cars, consumer goods, and even bedrooms more accessible and sharable amongst users

SMART CITY

City planners and tech companies make integrated decisions using sensors and open data for transport, pollution, energy, public health, water, and waste

INTEGRATED PLANNING

Planners integrate functions for water management, food production, flood control, recreation, and energy production to maximize resource utilization

ACCESS & MOBILITY

Governments re-organize around compact public transport systems that let citizens commute efficiently, and encourage the use individualized and smart electric vehicles

GREEN CITY

Planners use green infrastructure and buildings, urban agriculture, and distributed energy system business models to reduce urban ecological footprint

The Journey to Integrative Innovation

The Future of Wearable Devices

IN 2015...

164.2m
DEVICES WILL BE SHIPPED

THEY WILL BE...

6.4%	9.63%	20.9%	24.92%	35.0%
GLASSES, AUG. REALITY	CAMERAS, JEWELRY, CLIP-ONs	HEALTH CARE & DIAGNOSIS	WATCHES, WRIST-COMPUTER	ACTIVITY & FITNESS TRACKERS

HOWEVER...

1/3
USERS DISCARD THEIR WEARABLE DEVICES AFTER SIX MONTHS

Mkt Share
fitbit 58%
JAWBONE 21%
NIKE 14%

Types of Wearable Devices

HEALTH

Google Smart Contact Lens — Monitors glucose levels for the diabetic

OMSignal Biometric Shirt — Measures user's biometric data

FITNESS

Fitbit Fitness Band — Tracks walking, cycling, swimming and other activities

Micoach Smart Bra — Monitors heart rate, and workout progress

SECURITY

First Sign Belt Clip — Detects violent physical activity in case of attackers

Cuff Jewelry — Alerts a security network when pressed

LIFESTYLE

Lechal Smart Shoes — Directs the user by vibrating either the left or right sole

Google Glass — Uses voice control to allow for hand-free operability

INFANT CARE

Huggies TweetPee — Messages the parent when the baby's diaper is wet

SunFriend Band — Measures UVA+B rays to alert parents when beyond safe limits

POLICE STATION

SUCCESS FACTORS OF WEARABLE DEVICES

PHYSICAL APPEAL
Partnerships between fashion labels and hardware makers to create beautiful, highly functional, long-lasting, and affordable devices

INTEROPERABILITY
Established communication standards allow integration across devices thereby multiplying the number of possible consumer use cases

DATA MONETIZATION
Micro-segmentation of consumer insights for data-driven interactions, predictive modeling, value-added services, and product development

REGULATORY FRAMEWORKS
Protection of consumer well-being and privacy is critical in inspiring trust and providing meaningful recommendations for the consumer

DEVELOPER NETWORK EFFECT
Supportive ecosystem that incentivizes developers and service providers to build meaningful applications which enhance device usability

CONTINUOUS INNOVATION
Active research on sensing, deep insight on consumer wants, and design of new business models to uncover fresh applications

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A WORLD OF CORPORATE SOCIAL INNOVATION

SOCIAL INNOVATION

New approaches with robust business models that enable improved, sustainable, equitable, and scalable solutions to unmet social needs

WHAT IF GLOBAL CHALLENGES ARE ALSO OPPORTUNITIES TO

Meet social needs	Grow sustainably	Empower stakeholders	Raise living standards	Create awareness

- Corporations
- Shareholders

- Suppliers
- Employees / Trainees

- Communities
- Environment

- Stakeholder organizations

- Customers
- Beneficiaries

- Customers
- Society

DRIVERS OF SHAREHOLDER VALUE AND GROWTH

INCLUSIVE INNOVATIONS	RESILIENT OPERATIONS	ALTERNATIVE CHANNELS	NEW SEGMENTS	BELOVED BRANDS
e.g. Godrej	patagonia	Unilever	vodacom m-pesa	(RED)

SOCIAL BUSINESS MODELS

CONSUMING BENEFICIARY
Market / subsidized prices

Beneficiary / Consumer → Solutions to social problems → Social Business

PRODUCING BENEFICIARY
Training/ Jobs
Labour
Salaries

Beneficiary → Social Business

CONSUMING BENEFACTOR
Purchases/ Donates
Provides goods
Feel good factor
Solutions to social problems

Benefactor → Social Business
Beneficiary

RE-IMAGINE THE CORPORATION OF THE FUTURE

	TRADITIONAL INNOVATION	SOCIAL INNOVATION
IMPETUS	Maximization of profits	**Idealization** of integrated financial and social returns
TARGETS	Prioritization of market segments	**Immersion** into communities
PLANNING	Assets; research; strategy; development	**Re-definition** of challenges as opportunities for capacity-building
IDEAS FROM	Professional experts and staff	**Co-creation** and participatory decision-making
ASSETS	Ownership; governance; patents	**Co-ownership** of resources and operations
RELATIONSHIPS	Engagement; negotiation; incentives	**Alignment** of empowered stakeholders; facilitation of cross-sectoral networks
TRADE-OFFS	Balance and optimize	**Resolution** of trade-offs
IMPACT	Economic returns at minimal risk	**Scaling** solutions for systemic change to create sustainable advantage

HOW TO DRIVE DISRUPTIVE CHANGE

Amy Bonsall, Design Director, IDEO Singapore

Hotel room by hotel room, and grocery order by grocery order, startups like Airbnb, Flocations, and RedMart are taking on giants in established industries, rethinking everything from hospitality to food distribution. What made these companies successful, even in spaces that are dominated by big players? They have hit on an unmet customer need, firstly, but they've also created a supportive environment in which their particular product can thrive.

Developing and adapting key startup qualities can help big companies more consistently create growth through new ventures.

Get close to your customer

The startup team at Fabulis.com, a now defunct social networking site, was close to the ground enough to see that a small feature in their product was driving huge customer interest. They flipped this feature, a design deal of the day, into a new iteration of their service, Fab.com, which went on to see much greater growth than their initial social networking platform.

In large organisations, there's usually a gap between senior executives and the product team, those who have developed the on-the-ground knowledge of consumer needs and behaviours. This knowledge often doesn't make its way to the top of a large organisation, and decision-makers – even the CEO – are left without a deep understanding of who the end-user will be, and how the product will benefit them.

Aware of this potential risk, Sensis CEO John Allan left most key decisions about the design of new ordering and payment service Skip (www.skip.com.au) to his team, recognising that they were better placed to know what would drive customer usage. For instance, the team identified early on that it wasn't enough to help people order a product; the Skip service had to help with the end-to-end consumption process – from ordering all the way through to loyalty and payment. By incorporating these features early on, the team was able to gain a loyal cadre of customers, and they brought the new service to market quickly – it went from idea to pilot in just six months.

Large Singaporean organisations, which sometimes prioritise efficiency over putting consumers first, could start to introduce new products with a greater likelihood of success, by ensuring product decisions are made with the customer in mind.

> "Especially in Singapore, decision-making needs to be structured around a variety of factors, not just KPIs."

Evolve measures of success

When Airbnb was getting off the ground, its initial goals were to learn about how customers used the service and to adapt it accordingly. For instance, they found that amateur photos taken by their hosts created a sense of uncertainty for their guests, so they began offering free professional photography to hosts. They quickly found a two- to three-times increase in bookings for houses with the nicer photos. In this case, their measure of success was making a better experience for customers, and it drove revenue.

Processes and measures are usually designed to get existing products – often the core products on which the business was built – to market in an efficient way. When an internal team creates a new offering that will appeal to a different group of consumers, longstanding processes can act as lead weights, hindering the product's development. Especially in Singapore, decision-making needs to be structured around a variety of factors, not just KPIs.

Take Amazon for instance: It focuses its measures on driving customer satisfaction. For example, when they first launched their grocery offering in Seattle in 2007, by all traditional measures it was a bomb. Revenue was low and costs were high. Undaunted, and knowing they were addressing an unmet customer need, Amazon focused not on revenue or profit in the early days, but rather on what they were learning about customers and their own operational system. Seven years later, AmazonFresh has evolved into a smart model both for customers (get your groceries in time for dinner) and for Amazon (they've built a subscription service that encourages frequent orders).

Create an ecosystem that supports design

When black car company Uber was starting out, they worked with Y Combinator, an accelerator, or programme to help startups evolve their products quickly and smartly. Mentors in the accelerator helped them make key decisions on how to support the nascent product. And they acted as links to helpful people and companies.

New products in big companies face double challenges – they often don't have access to mentors that help them push their product in a new way, and on top of that they have an organisation that is actively making it hard for the product to succeed. Well-meaning but underinformed colleagues in various departments such as legal and marketing will try to enforce certain rules that limit the potential of a new idea. And mentorship from those who are well versed in getting new and different products to market is noticeably absent.

Establishing a deliberate startup ecosystem can allow large companies to place small bets on a handful of new ventures, including those that might appeal to customers that the company isn't currently serving. In Singapore, even in the startup stage, organisations often put strict ROI targets on new initiatives, rather than nurturing them with resources and mentoring.

In contrast, at Intuit, the American company that develops tax and accounting software, founder Scott Cook and CEO Brad Smith have created an environment for experimentation and risk-taking. IntuitLabs encourages anyone with an idea to explore it, and Cook himself runs frequent – often daily – lunchtime office hours where he mentors and provokes these nascent startup founders.

How to drive
disruptive change

Thanks to these initiatives, Intuit now counts more than $100 million in revenue from products that didn't exist just a few years ago.

Companies with the courage and foresight to adopt – and adapt – startup behaviors will ultimately secure their own future and lead innovation in their industry. By acting nimbly, these industry leaders can better respond to, and drive, disruptive change. ∎

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LESSONS FROM INNOVATION LEADERS

Eric Almquist, Alex Roth and Pankaj Saluja, Partners, Bain & Company

Innovation does not come easily to most large companies. Yet some big players in nearly every industry are able to turn out one successful new product after another.

Take Unilever for example. Already a leader in the consumer goods category, the company increased the average size of its innovation projects 30 per cent since 2013, and these stand to deliver 20 per cent more revenues than they did at the end of that year. The company is quick to adapt new products to consumer tastes when necessary. Unilever Hindustan has encouraged employees to buy new products at steep discounts and then provide quick feedback, effectively turning them in to in-house beta testers.

The pharmaceutical giant, Novartis, is also a standout in innovation. In a climate where other companies are slowing down new drug development, Novartis is keeping pace. According to the company, which tries to identify multiple uses for a discovery, it has received more US and EU approvals for new molecules in a recent four-year period than its competitors.

What makes companies tick at innovation?

What do such companies know that their competitors don't? For the answers, we asked nearly 450 executives around the world about the skills – or lack thereof – of their companies with regards to innovation. Our respondents represented enterprises in nearly every major industry, ranging from $100 million to more than $10 billion in size.

The survey revealed dramatic differences between innovation leaders and, everyone else. Top-quartile companies grew at an average annual rate of 13 per cent, compared with 5 per cent for the others. The former also enjoy far greater employee loyalty, and they are better than their peers at making and executing decisions.

When we drilled down to what made these leaders tick at innovation, we found not one single factor but an entire system built around these five components:

- The leaders set a clear, specific strategy for innovation
- They build an organisational culture that nurtures new products and processes
- They create effective processes for idea generation and development
- They know how to manage a diverse portfolio of innovations – and that has the appropriate size, shape, and speed of development
- They are effective at scaling new business ideas, supporting them with the right level and type of resources

> "Statistical analysis of our survey results showed that two elements of an innovation system are likely to be critical: innovation goals and strategies on the one hand and portfolio management on the other."

Lessons from innovation leaders

The leaders outperformed the laggards on all these capabilities, not just one or two – a sure indication that they are taking a systematic approach to innovation. Kraft, for example, added rigour to its idea development process by setting consistent hurdles for projects and tying its decisions more tightly than ever to the economics of each project. In 2011, it generated $600 million in sales from a comparatively small group of innovations.

We learned something else, too. Nearly all the leaders seem able to marry right-brain-style creativity and imagination with hard-nosed, left-brain business analysis in every phase of their innovation systems. Many companies tend to separate these two activities, asking the creatives to come up with new ideas and the commercial types to analyse those ideas (and, who so often, shoot them down). It turns out it is far more productive for companies to build integrated teams that bring together people with both orientations and skill sets.

Use your "BothBrain"

Using this "BothBrain" approach, teams can work together from idea conception all the way to testing and scaling an innovation. For example, a successful portfolio of innovation always needs to include a balance between incremental and radical ones. To create that balance, companies have to give their creative people more leeway on radical innovations – and not allow analysts with spreadsheets to kill the ideas prematurely. Creatives and commercials can then work through the twists and turns of idea development together, rather than giving up whenever one group hits a bump in the road.

Statistical analysis of our survey results showed that two elements of an innovation system are likely to be critical: innovation goals and strategies on the one hand and portfolio management on the other. The element we thought might be most important – idea generation – was not a major determinant of top innovation performance. We suspect that is because ideas are only the seeds of innovation. Put good ideas in a bad company and they die.

Innovation is a complex process that companies have to manage as they do with any other. Companies need to create an innovation system that includes all five of the factors that we identified. But innovation cannot be a purely logical, left-brain enterprise. Companies that cultivate both kinds of thinking – left brain and right brain, creative and commercial – to inform their innovation initiatives are likely to outstrip their competitors in creating great new offerings. ■

HOW BIG BANG DISRUPTION IS CHANGING THE GAME IN ASEAN

Dwight Hutchins, Managing Director, Accenture Strategy, Products, Asia Pacific, Accenture

The saying "you'll never change the world by following the rules" has been attributed to everyone from Steve Jobs to Mahatma Gandhi.

Whoever said it first, one thing is for sure: in the new economy, startups with little or no experience or capital – and scant respect for rules – can take over half your global market before you can even grasp what is happening.

"Old guard" companies often fall victims to these digital upstarts – either because they didn't see the "big bang disruption" headed their way or, because they saw it but failed to act in time.

These disruptions have happened before, of course, but now they are happening much more quickly.

Business leaders know the basic playbook for saving a business from disruptive innovation. Nearly two decades of management research have taught companies to be on the lookout for new competitors that offer cheap substitutes to their products; aim to capture new, low-end customers; and then gradually move upmarket to pick off higher-end customers too. When these disrupters appear, it is time to act quickly.

But in the Association of Southeast Asian Nations (ASEAN) region and indeed globally, we're seeing a completely new phenomenon. The disruption isn't coming from competitors in the same industry or even from companies with a remotely similar business model. Nor is the new technology entering at the bottom of a mature market and then following a carefully planned march through the larger customer segments. Instead, customers are making the switch in a matter of weeks – and in droves.

Such innovation changes the game. Whole markets are being created or destroyed overnight. Disrupters can come out of nowhere, and thanks to today's technologies, they can be everywhere, instantly. These so named big bang disrupters don't just create dilemmas for innovators, they trigger disasters.

The good news is that today's new wave of disruption holds immense potential for companies that can move fast – those that know how to everage the opportunities disruption presents.

As a first step, business leaders must ascertain the movement of disrupters in their own industries, and begin to put in place the capabilities necessary for success in a world that doesn't play by the old rules.

> **"As a first step, business leaders must ascertain the movement of disrupters in their own industries"**

The pace of change is at warp speed

The rapidly and constantly evolving technology of today – when the phone in your pocket has more computing power than the Apollo spacecraft that landed man on the moon – means that companies wanting to stand apart from the rest must enhance the "experience" and "convenience" they are delivering to customers.

Innovative new products and services that exploit digital technology now enter mainstream markets not only better and faster, but also cheaper. Technologies with the potential to evolve exponentially – like the computer processor, the cloud, mobile devices, and broadband networks – are quickly driving down costs in key business areas.

In a fully connected, always "on" world, these new offerings are also better integrated with the way customers live and work – in strategy terms, they provide greater 'customer intimacy.' And word of their superiority in all relevant dimensions now travels the globe in a flash, like the latest YouTube sensation.

Fast to market: The new path of big bang disruptors

Big bang disruptions do not follow the usual pattern of customer adoption famously described by management guru, Everett Rogers. According to his model (shown in blue), new products sequentially gain popularity with five market segments. The big bang model (shown in yellow) is taller and much more compressed. New products are perfected with a few trial users and then embraced quickly by the vast majority of the market.

Source: Accenture Analysis
Note: This chart appears in "Big Bang Disruption: The innovator's disaster" from
Outlook 2013 No 2, an Accenture publication. Copyright 2013 Accenture. All rights reserved.
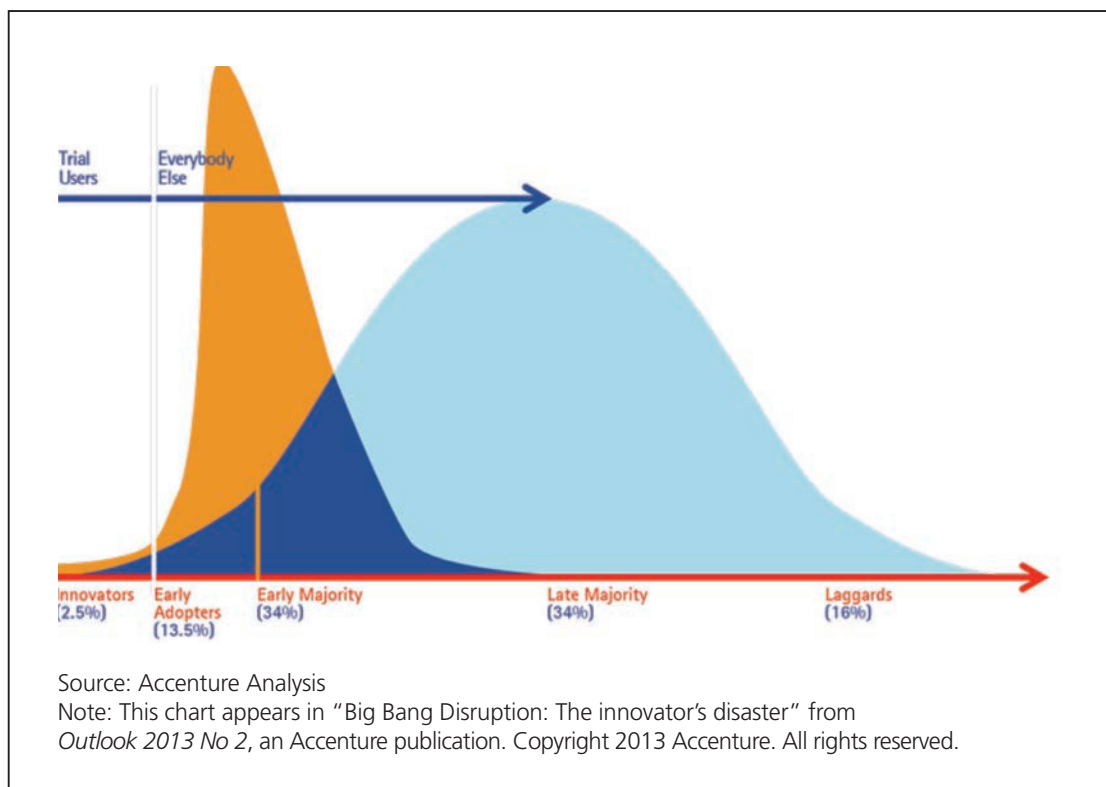
How big bang disruption is changing the game in ASEAN

How have established companies experienced disruptive innovation?

A few early examples are the mapping industry and GPS navigation, and the global taxi industry. These sectors suffered when new entrants – outsiders – offered more customer convenience and a better customer experience than the established operators could.

When Google launched its free app Google Maps Navigation, the company was, most likely, simply looking to drive more eyeballs to more advertisements by integrating more already-digital information. But from the outset, the app outperformed expensive, standalone GPS devices on every strategic dimension. It is cheaper (in fact, it is free); it is constantly being updated and enhanced in real time; and it offers a more customer-intimate solution by connecting with other smartphone apps, search results, email content and contacts.

Little surprise, then, that the major players in the GPS device market lost as much as 85 per cent of their market cap in the 18 months after the introduction of Google Maps Navigation[1].

Disruption is now attacking even hard-asset businesses. Consider the impact of new smartphone-based applications such as Uber on mature taxi and limousine services. These new businesses allow customers to order and pay for rides with a mobile device, track dispatched rides using location services, and rate the driver after each trip– and at last count were available in 56 countries. In 2014, Uber alone was valued at US$41 billion[2] and it doesn't own a single taxi.

The digital consumer in the ASEAN region: always on, always listening

Source: Accenture's *Engaging the Nonstop-Customer* study (1,859 consumers in ASEAN were surveyed via the Internet in July 2013)
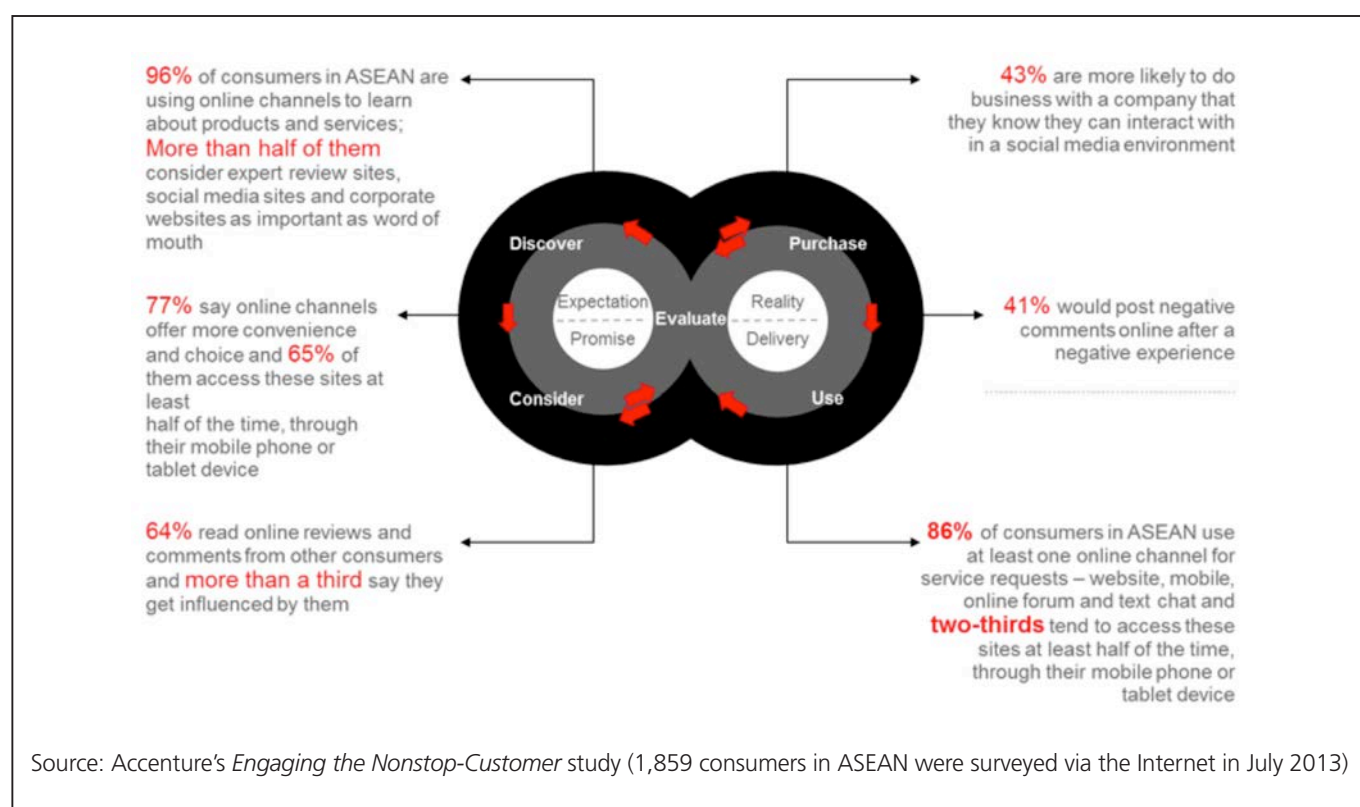
What are the global opportunities for leveraging disruption and winning customers?

As today's disrupters have shown, opportunities abound when it comes to winning the hearts and minds – and money – of new customers around the world. Within the 10-country grouping of ASEAN, for example, companies have already begun to discuss the impact on their industries of these big bang disruptive innovations, and are planning what they must do to succeed in what will be the sixth-largest economy in the world by 2020.

In March 2015, the American Chamber of Commerce (AmCham) in Singapore hosted a panel to discuss disruptive innovation. Participants included top APAC management from digital disruptors such as Airbnb, LinkedIn, PayPal, and others. More than 450 delegates from the 27 AmCham chapters within the Asia-Pacific region attended the event[3] .

The reason the event drew such interest is that by the year 2020, the ASEAN region will have a US$3 trillion economy and a population close to 600 million people[4]. About 100 million of those people will be joining the consuming class for the first time or moving to higher income tiers and will generate US$770 billion in new consumer spending[5].

Businesses will be able to reach approximately 80 per cent of these new consumers via their mobile devices with nearly half being accessible through smartphones[6]. Companies have an opportunity to target these new consumers at unprecedented speed and create interactive experiences that build demand and lock in loyalty.

ASEAN consumers rely on digital technologies throughout the purchasing process, so companies will need to refine their media strategies and lead with a "digital first" orientation to win them.

Strategies for success

To win customers and overcome the competition in the ASEAN region, companies need to anticipate disruptive innovations and quickly take advantage of them by focusing on three main areas:

- **Locking in the new consumer.**
  Companies need to use available technologies to create an awareness of their products and services, and lock in future demand by building loyalty. This means engaging new consumers early, often and with precision – and giving them a better experience and more convenience than the upstart competitors. Companies must also use technology and analytical functions to gain deep insights into customer needs and desires and price points.

- **Ensuring products and services are only a finger-tap away.**
  Companies should make sure their supply chains are robust enough that products can be available wherever their customers are. This is a daunting challenge, especially in the 25,000 islands that make up the Philippines and Indonesia. Establishing this omnipresence will require improving the reach and

productivity of sales forces, and applying superb logistics management to ensure coverage across complex, multi-layered distribution channels.

- **Putting in place an operating model for fast, agile execution.**
  Building an effective operating model tailored to the ASEAN region will create the consumer reach and product/service availability companies need to survive and succeed. This operating model will need to be regional to secure scale efficiencies and critical mass, while also reflecting distinctive local insights and action.

Fit for the future

You cannot see big bang disruption coming. You cannot stop it. You cannot overcome it, either. It is probably safe to say that this is something that will be keeping business leaders in every industry in a cold sweat for a long time to come.

But as we have seen, big bang disruptions also hold huge potential for those who can quickly learn the new rules of unencumbered development, unconstrained growth and undisciplined strategy. The trick is to remember these four key words of advice: "Be aggressive" and "Move now." Act boldly and decisively, in other words – not with a whimper, but with a bang. ∎

[1] Big Bang Disruption: Strategy in the Age of Devastating Innovation by Larry Downes and Paul Nunes

[2] Wall Street Journal http://graphics.wsj.com/billion-dollar-club/

[3] American Chamber of Commerce Singapore

[4] Accenture analysis based on data from Global Insights 2013

[5] Accenture analysis based on data from Euromonitor International 2013

[6] Accenture analysis based on data from Euromonitor International, 2013, Credit Suisse Indonesia Consumer Survey 2014

INNOVATION IN BUILDINGS: GREEN AND ENVIRONMENTALLY SUSTAINABLE SOLUTIONS

Esther An, Chief Sustainability Officer, City Developments Limited

Singapore's global reputation as a Garden City is undisputed.

Despite the rapid urbanisation, more than half of the island is still covered in greenery, made up of 2,000 species of native plants. The lush greenery, rich biodiversity and tree-lined streets have earned Singapore the title of Asia's Greenest City[1].

Of course, the break-neck development, population growth and affluence are taking a toll on already-scarce natural resources – especially energy and water – and the environment. With plans to potentially house 6.9 million people by 2030, the demand for natural resources and land will inevitably increase. The need to prioritise environmental conservation in our nation has become pressing.

And the government is sitting up, and taking action. The Ministry of the Environment and Water Resources announced regulations to mandate water reporting for large commercial premises with high water consumption of 60,000 m^3 from January 2015, and to increase the adoption of solar power in new buildings to 350 MWp by 2020. Greater emphasis has also been placed on changing the behaviour and practices of end-users, as highlighted in Singapore's third Green Building Masterplan.

In November 2014, the *Sustainable Singapore Blueprint 2015* was released, calling for businesses, particularly those in the building sector, to strive towards erecting more green buildings and skyrise greenery and using smart technologies, recycling and more solar power. After all, the building sector is the third largest contributor of carbon emissions in Singapore. Clearly, the sector including end-users can and must make a positive difference to the environment.

Pioneering building innovation

In the 1980s and 1990s, the building sector was widely perceived to be causing negative impact on the environment before it even began construction. A paradigm shift was required.

For City Developments Limited (CDL), the journey began in 1995 with the establishment of a vision: "Conserving as we Construct". Corporate social responsibility and sustainability have since been embedded in CDL's corporate DNA, and the result is a relentless drive to push boundaries and revolutionise the way buildings are designed and constructed.

Through continued innovation and collaboration with the public and people sectors, CDL has set benchmarks for green buildings and raised the standards of sustainable practices in Singapore. CDL's Savannah CondoPark

> " … creative innovation must now turn to the climate challenge, arguably the greatest economic challenge of our time "

Innovation in buildings: Green and environmentally sustainable solutions

– Singapore's first eco-condominium in 2002 – was a trailblazer in using prefabricated bathroom units, which was made mandatory by the authorities in 2014.

CDL also pioneered the use of the prefabricated construction concept for the CDL Green Gallery at Singapore Botanic Gardens in 2013. Prefabricated building modules were built off-site and then hoisted into position on-site and assembled in a Lego-like manner. The six modules of the Gallery were installed in less than 24 hours with minimal environmental impact on the site.

Additionally, for the first time in Singapore, a biomaterial known as Hempcrete (largely made from the hemp plant) was also used to build Singapore's first zero-energy Green Gallery. Besides being durable and hardy, Hempcrete has excellent thermal and acoustic properties and is resistant against mould, fire, and pests. The use of full-scale Prefabricated Prefinished Volumetric Construction (PPVC) technology was later adopted for CDL's 638-unit executive condominium project Brownstone, at Canberra Drive. It is set to be the world's largest application of PPVC with over 5,000 building modules involved.

The CDL Green Gallery @ Singapore Botanic Gardens Heritage Museum is Singapore's first zero-energy green gallery.

Skyrise greenery came to life at the Tree House Condominium – a striking 24-storey, 2,289 sqm green wall that has set a Guinness World Record for the largest vertical garden.

The resulting productivity in saving 55,000 man-days, completing the project four months ahead of schedule, better quality fixtures, reduced material waste, as well as safer and cleaner building construction sites are some of the advantages of employing this prefabricated innovation.

As a property developer with many suppliers, CDL actively engages its supply chain with initiatives to adopt best sustainable practices and high Environment, Health and Safety standards.

In 2010, CDL made it a standard practice to conduct a Biodiversity Impact Assessment at its development sites. In 2013, in consultation with National Parks Board, CDL conserved 50 existing mature trees at a development by keeping them protected throughout the construction process.

In 2014, CDL set a Guinness World Record for the largest vertical garden at Tree House condominium, which was designed as a natural insulation to filter pollutants and carbon dioxide out of the air as well as reduce heat absorption, thus cutting down on the energy needed to cool indoor spaces by between 15 and 30 per cent.

CDL invests two to five per cent of each new development's construction cost in eco-friendly features and sustainable construction. Yet, it has remained profitable mainly through prudent cost management and innovation, guided by the triple bottom line philosophy.

A green city starts with the right mindset

That said, green infrastructures and buildings alone will not make Singapore a sustainable city. To achieve a clean, green and liveable city, we need to change mindsets and behaviour of users.

A study by the World Business Council for Sustainable Development has shown that human behaviour is as important as the physical infrastructure of the building when it comes to energy use. This is why proactive engagement of stakeholders in environmental conservation and sustainability has always been a key focus area for CDL, with initiatives such as the Green Lease Partnership Programme and My Tree House – the World's 1st Green Library for Kids.

This year, as Singapore celebrates its 50th year of independence, it is poised to move to its next stage of growth. This is why we as a nation need to encourage greater innovation and mindset change – at work, at home, at schools and within the community at large – for environmental sustainability's sake.

As Christiana Figueres, Executive Secretary of the United Nations Framework Convention on Climate Change once said: "Innovation has historically been at the heart of the greatest business and financial successes, and creative innovation must now turn to the climate challenge, arguably the greatest economic challenge of our time". ■

My Tree House – the World's 1st Green Library for Kids – offers children a creative space to explore the environment. (Located at Central Public Library)

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[1] *2011 Asia Green City Index*. The Index and accompanying study were commissioned by Siemens and developed by the Economist Intelligence Unit (EIU).

STAYING RELEVANT IN A CHANGING RETAIL MARKETPLACE?

Gerry Lee, Deputy CEO, Singapore (Operations), NTUC FairPrice

For retailers, a critical success factor is being able to stay relevant to consumers' changing needs and lifestyle.

Consumers now have more ways to meet their retail and grocery needs than ever before, with niche retailers targeting very specific consumer segments and the growing acceptance of online providers as a viable alternative to traditional retailers. Customers' expectations have also evolved, with increasing affluence, greater demands on service and easier access to information for reviews, comparisons and exposure to new, alternative products, services and providers.

Hence, retailers have to constantly review their business models and be nimble in implementing innovative solutions to serve their needs better. In order to stay competitive while meeting the changing needs of customers, retailers are compelled to adopt a strategy of continual adaptation.

Rise of the new consumer

As shoppers become more affluent and well-travelled, their expectations on quality and variety have risen. They seek out more international products to meet their changing tastes and lifestyles. Today's customers are also more pressed for time than ever before and have a penchant for completing their errands on-the-go as much as they can. All these translate to a need to cater to an increasingly segmented market.

NTUC FairPrice has for this reason evolved from its traditional, single brick-and-mortar format to a multi-pronged one. To cater to the mass affluent customer, there is FairPrice Finest, which offers the best of both worlds – a mix of cosmopolitan products along with daily essentials that are uniformly priced across all FairPrice supermarket formats and locations.

For the time-strapped household decision makers, FairPrice Xpress was introduced in 2003, providing round-the-clock grocery shopping for customers at service stations. On top of that, the outlets also provide value-added, time-saving services including over-the-counter bill payment services, courier services and cash-remittance services. In effect, this convenience retail concept transformed the petrol station retail landscape in Singapore.

Tech part in grocery buying

In recent years, thanks to easy Internet access and high smart phone and mobile devices adoption rates in Singapore, local and international retailers have jumped on the online bandwagon, fuelling the popularity of e-shopping.

> **"**In order to stay competitive … retailers are compelled to adopt a strategy of continual adaptation.**"**

To cater to customers who wish to shop in the comfort of their own home and convenience of their mobile device, FairPrice pioneered FairPrice Online. This was in 2003, way before online shopping gained popularity in Singapore.

Since its launch, FairPrice Online saw a 20 per cent year-on-year growth in sales and has over 100,000 subscribers today. Attuned to customers' needs and developments in the market, FairPrice Online further expanded its delivery options to include Click&Collect in 2014. Click&Collect gives shoppers the option to collect their online purchases at a preferred FairPrice store or service station. This offers greater convenience for time-stretched customers, who may not be able to receive deliveries of their online purchases at home.

While it is important to meet customers' needs, it is equally crucial to not neglect bettering existing infrastructure, operations, productivity and even customer service – after all, the customers still need to be wowed. However, with an increasingly tight labour market and challenges in attracting staff to the retail sector, a different tact needs to be employed.

A strategy which FairPrice adopted and that is bearing fruit is the leveraging of technology to reduce the number of staff needed to physically work in the stores. First, FairPrice used barcode scanning systems to ensure pricing accuracy and speed up the check-out process.

Progressively, it moved on to install more advanced systems like self-checkout counters (SCO) that allow customers to self-serve and process payment for their own purchases, thereby saving on manpower. SCO requires only one attendant to assist with four to six checkout counters as opposed to the usual ratio of 1:1 for traditional checkout counters. Now, close to 30 stores are equipped with dedicated self-checkout lanes, enhancing operational efficiency and productivity gains by about 80 per cent. The SCO system has allowed the attendants to focus more on customers and service levels, thereby improving customer satisfaction and staff efficiency levels at the same time. Electronic shelf labels that are being updated through a central system is also helping speed things along.

Service is still first

In an increasingly competitive and fragmented marketplace, coupled with increasingly volatile food prices, and heightened pressure on manpower resource, retailers will have to relook how they run their businesses and be ready to respond just as quickly to the changing needs of the customers they serve.

While technology will be a key catalyst to enhance productivity, more importantly, retailers should always remember the heart of its business centers around being able to serve their customers and cater to their changing needs. For FairPrice, keeping abreast of consumer and market trends, anticipating new developments and investing in innovations to stay ahead of the curve over the long term are a core part of its strategy to remain competitive and sustainable. ■

THE WHYS OF BUSINESS PROCESS OUTSOURCING

Chester Leong, Director, Boardroom Business Solutions and Victor Lai, Director, Business Development, Boardroom Limited

Business Process Outsourcing (BPO), which involves contracting a third party of a specific business service to outsource certain back-office functions, is in vogue.

Fast becoming a key business strategy, BPO owes its origins to manufacturing firms outsourcing large segments of supply chain management to third -party service providers, transforming fixed cost into a variable one. One of the key benefits of BPO is that when tapped on optimally, it can deliver sustainable competitive advantage.

Benefits of BPO

The boons of BPO are aplenty, but there are few that are noteworthy, namely cost-savings and better cost control; increased flexibility and the ability to respond quickly to environmental changes; removal of key-man risk; and assurance of qualified manpower resources. And these deliverables are intertwined with one another.

Cost savings is a preoccupation for many businesses and can take many forms. For example, when high value capital expenditure investments are being considered, say when purchasing a payroll software engine, such costs can be mitigated by taking advantage of lower cost software subscription model (SaaS) offered by many payroll service providers. Purchasing a robust software engine for in-house processing could set the company back by tens of thousands of dollars, not to mention the additional thousands in annual software maintenance charges. Outsourcing the payroll typically only entails paying a nominal monthly processing fee, and that includes use of payroll software.

This brings us to managing costs.

Outsourcing allows the company to manage costs better because the relevant fixed costs become variable costs once the processed is outsourced. Again, in the case of outsourced payroll for example, the fees charged by the service providers are generally pegged to the actual headcount processed, so when headcount drops significantly, the fees correspondingly fall. On the other hand, the outright purchase of the payroll software engine is a sunk cost, regardless of headcount changes. This point also illustrates the flexibility gained from outsourcing payroll, which enables the company to respond to changes in the operating environment quickly and effectively without being burdened with fixed costs.

When weighing the merits of processing a back-office function in-house versus outsourcing it, direct cost is not the only consideration in the cost

> **"**One of the key benefits of BPO is that when tapped on optimally, it can deliver sustainable competitive advantage.**"**

equation. Many companies fail to take into account the indirect costs. To flesh this out better, consider this example:

A newly incorporated Singapore subsidiary of a European company in the life-style sector decides to prepare its accounts in-house instead of outsourcing it. As the company adopts a lean headcount policy in a bid to contain costs, the responsibility of preparing the accounts will fall on a fairly junior and inexperienced accountant. To facilitate the accounting work, the company intends to invest in accounting software.

Below is a comparison of the costs incurred by the company and the potential savings, if they had outsourced the accounts preparation from the beginning.

Cost Element	In-house (pm)	Outsourced (pm)	Savings (pm)
Staff salary and benefits (1)	S$3,722	Nil	
Overheads (2)	S$744	Nil	
Depreciation-accounting software (3)	S$555	Nil	
Software maintenance charge (4)	S$250	Nil	
Outsourcing fees (5)	Nil	S$2,200	
Total cost	S$5,271	S$2,200	S$3,071

The above calculation is based on the following assumptions:
- Basic salary at S$2,500 per month, excluding bonus, employer CPF and medical/insurance benefits
- Rental, utilities, IT cost, etc, computed at 20 per cent of (1)
- Software cost of S$20,000 depreciated over 36 months
- Based on 15 per cent of software purchase price
- Approximately 100 accounting transactions per month

Reducing risks

In a talent-hungry operating environment, businesses are constantly battling for limited resources. Even after securing that prized staff, there is still the constant worry of attrition and key-man risk. Outsourcing back -office functions provides companies access to a wealth of experienced professional help on demand, without the worry of having to retain that headcount. Typically staffed by a highly trained pool of professionals, outsource service providers can alleviate the concern that smaller companies may have about gaining access to the right kind of help.

Without the right kind of help, mistakes can be costly. A Singapore subsidiary of a US Listed company in the Information Technology sector used to process its payroll in-house for a number of years. Over that period of time, due to the lack of proper training and staff experience, the payroll officer incorrectly treated commissions as "Ordinary Wages" instead of "Additional Wages", resulting in a significant shortfall in CPF contributions, in excess of several hundred thousand dollars. This surfaced when the payroll officer resigned and the company decided to outsource instead of hiring a new staff. The service provider alerted the company of the incorrect treatment and resultant shortfall and assisted the company to undertake a voluntary disclosure to CPF Board.

The whys of business process outsourcing

Due to the extended timeframe over which there were CPF under-contributions, the interest penalties levied upon the company by CPF Board also came up to several hundred thousand dollars.

These are hard lessons to be learnt on the benefits of outsourcing. That said, outsourcing remains more commonplace among the MNCs, which are more compliant, control-focused and generally concerned about headcount being harnessed in revenue producing roles than in a back-office functions. But outsourcing is quickly gaining acceptance with SMEs as well. And from the above illustrations, the reasons are compelling.

Adding value to organisations

Back Office Outsourcing

Business Transformation Services

Accounting Services

Human Resource Consulting

BPO

Finance Service

Recruitment Outsourcing Services

Payroll Services

Front Office Outsourcing

Customer Support Services

BPO

Contact Center Services

Tech Support Services
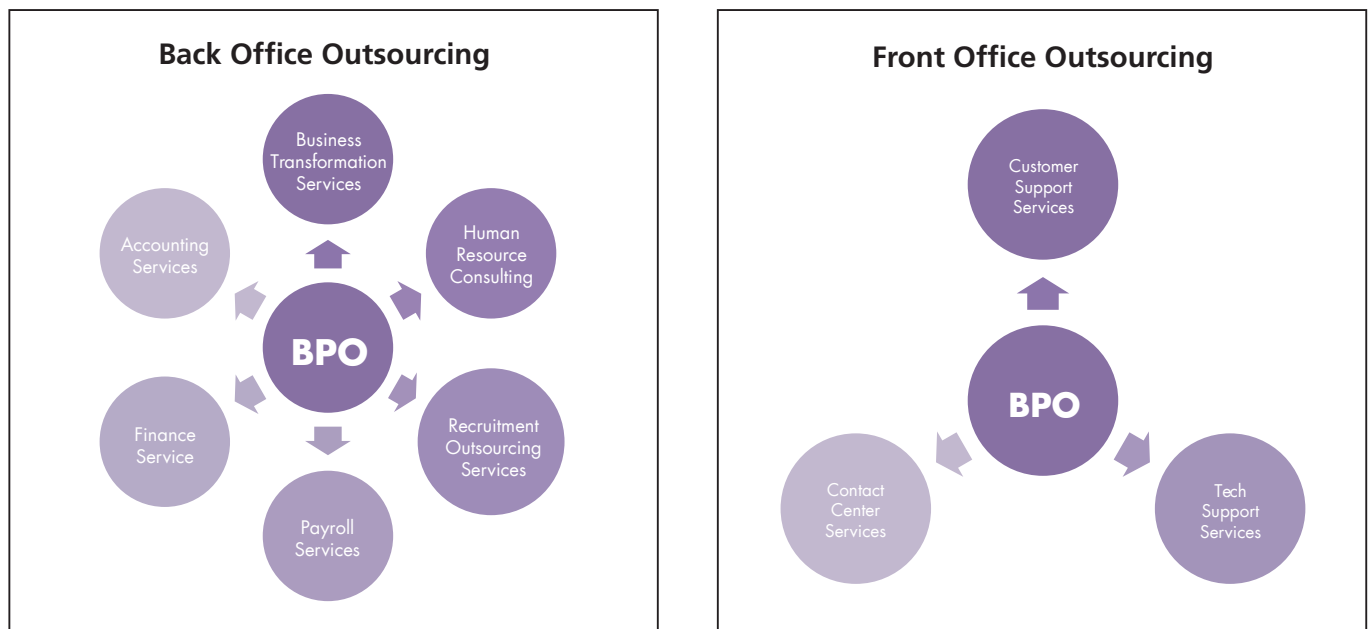
The added value proposition that outsourcing brings to the table hinges on the following key components:
- Adding structure and control to the existing processes
- Ensuring accuracy and regulatory compliance
- Turning fixed cost into variable cost
- Reducing the dependency on internal resources
- Reducing processing cost
- Allowing for more efficient planning and utilisation of businesses resources
- Allowing greater focus on core competencies
- Helping to implement better control over the timing, flow and quality of information between the company's various stakeholders

At the end of the day, focusing on its core activities allows the company to channel its energies and resources into revenue generating activity, mitigate manpower related issues, and reduce compliance risks. Back-office functions such as payroll, accounting, recruitment, etc, may be non-core activities but it does not lessen their importance as critical business functions which deserve proper attention and due diligence in the good hands of outsource professionals. ■

Readings: Innovation and Boards

INNOVATION: WHY BOARDS SHOULD CARE AND LEAD IN IT

Poh Mui Hoon, Council Member, SID

In today's business environment, it is becoming increasingly apparent that only those who change, and do so fast, will have a future.

Innovation has moved a rung up the ladder from being a corporate buzzword to a key business strategy. Companies can no longer afford to rest on their laurels as they risk becoming obsolete.

No change, no future

Examples of such companies are aplenty. Nokia, the kingpin of the mobile phone industry in the 2000s, saw its share in the global smart phones market plummet to a low of 3.1 per cent in 2013 from 50 per cent in 2007. This business was eventually acquired by Microsoft.

Kodak, an imaging solutions powerhouse in the 80s and 90s, made its largest blunder not seizing opportunities in digital photography – ironically, a technology that the company invented back in 1975.

Closer to home, household names such as Emporium Holdings remain a distant memory as its outlets were replaced by more contemporary shopping destinations such as Yaohan, which in turn was replaced by Takashimaya.

Survival of the most innovative

At the same time, there are others that have done exceptionally well because they care to innovate to remain relevant.

Prime among them is Amazon. The online retailer has not only driven many brick-and-mortar book stores out of business but has become the largest e-commerce company in the US. Its success has been credited to its founder Jeff Bezos who said: "If you double the number of experiments you do per year, you're going to double your inventiveness."

In Singapore, Eu Yan Sang is leading the way when it comes to reinventing the traditional Chinese medicine (TCM) wheel. The company has taken an age-old practice, validated it through new distribution methods and made it relevant to the newer generation with clinically-proven products, modern packaging and branding that speaks to them.

OSIM International is another company that has spared no expense to innovate. Through harnessing the right technologies, it creates highly sought after products and thereby, influence consumers' way of life. These efforts have cemented OSIM's leadership position in the health and wellness segments.

> "Without the board's push, management may just focus efforts on incremental, non-risky projects and completely ignore the real needle movers."

Cultivating a creative culture

These examples have made it plain that innovation – that is relevant and done at the right time - holds the key to sustaining a business. Surely, that alone should be reason enough for the board to be in the driver's seat of the innovation wagon. Often, however, boards tend to just involve themselves with governance matters and leave the responsibility of innovating to the CEO and the senior management team.

To be fair, many boards are trying. More companies (and not necessarily only the technology related ones) are prioritising the innovation agenda. This is evident in the C-suite hires that are being made. For example, cosmetics giants L'Oreal and Estée Lauder have onboard a director of digital innovation, and director of digital and global corporate innovation respectively. Candy maker JM Smucker now has a director of innovation and Starbucks, a director of global innovation.

Governing innovation

While senior management can establish an innovative culture through the people they rope into the company, the board can play a big (and active) role in shaping the processes and philosophies and getting senior management to put an innovation strategy in place, and to track and measure the effectiveness of the strategy.

Today's CEO's scorecard typically looks at four indicators: financial, market share, operational efficiency and people development. Innovation is seldom tracked directly, if at all, and most of the time is hidden deep within the general indicators like market growth, market share and so on. There should be a standalone indicator for innovation.

The board can then drill down into areas such as product innovation, process innovation, marketing innovation, organisational innovation and strategic innovation.

Many companies fail to innovate as they do not take enough risk. In this respect, boards can steer management to take calculated risks to drive innovation. Without the board's push, management may just focus efforts on incremental, non-risky projects and completely ignore the real needle movers.

When the right innovation strategies are in place, the board's role then turns into that of championing excellence: to continue questioning the existing strategy that the company has adopted, and how it fits into or is relevant to the business. More importantly, the board needs to be the one continually asking senior management if the company's current business strategy still works.

Directors with the ability to see the world through different lenses, anticipate and then try to fill the gaps are invaluable contributors to their boards. The ability to see what others cannot see and do what others will not do is the cornerstone of innovation. ■

DIGITAL DIRECTORS: THE BOARD'S ROLE IN THE CYBER WORLD

Thio Tse Gan, SEA Cyber Security Leader, Deloitte Southeast Asia

Cyber security is no longer a realm reserved for the IT specialists. Today, cyber security threats are so detrimental to business bottomlines that corporate boards are sitting up, taking notice and wanting to do something to stop it.

It is estimated that a billion records were compromised in 2014[1] and the average loss for each breach ranges between US$52b and US$87[2]. Further, the advancement of computing power in tandem with Morse law[3], coupled by the level of sophistication of cyber criminals means that cyber threats are growing at an exponential rate and are no longer random.

With the stakes so high, what should directors do to ensure their companies are adequately protected against cyber threats?

The tide has turned to technology

Boards that were traditionally used to focusing on strategic and governance risks now find themselves delving deep in to technology as it is becoming an increasingly critical determinant of a business's success. Yet, the same technology also poses risks to organisations; these risks need to be understood and managed.

To effectively provide oversight and governance, boards first need to understand the different types of "actors" that exist, their level of sophistication and their determination, as illustrated in the diagram below.
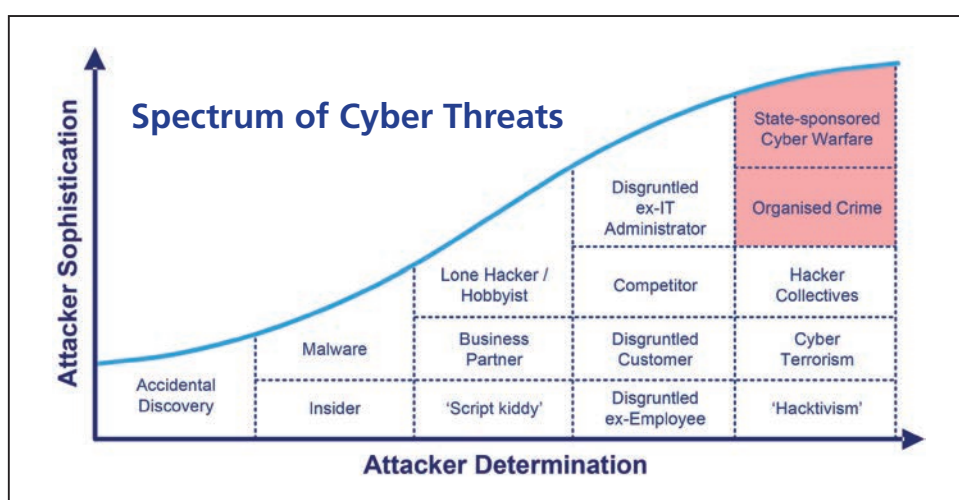
Cyber criminals strategise and target organisations that maximise their return on investment, and the most demanding perpetrators go where the end goal is monetisation of the records that they are able to compromise.

As a next step, directors must recognise and understand the importance of their organisation's digital assets such as data, information, applications and networks that exist within the organisation. This also extends to its suppliers,

"… directors must recognise and understand the importance of their organisation's digital assets such as data, information, applications and networks…"

vendors and other partners, and to data and information that resides in employees' mobile devices. To gauge the vulnerabilities of these assets, directors should ask the following questions:

- What information is leaving the organisation, and how?
- What are the "crown jewels" that we must protect?
- What are the cyber threats that our organisation faces?
- How do we know our controls are operating effectively and have they been validated?

The answers to these questions will help set the tone for transparency and a two-way conversation between management and the board, setting up a "ladder" approach in which threats are categorised and managed according to their associated risk with the appropriate priority and resources.

Holding the fort

Guarding against cyber threats is a mind-set change across the entire organisation and it should be devoted to three key areas:

- **Security**. There should be security of data and systems centres on risk-prioritised policies, procedures, and controls, for example: devices, e-mail, home-based data, and third-party data use (which is important because of the increase number of vendor and outsourcing arrangements).

- **Vigilance**. This means rapidly flagging violations and suspicious occurrences and responding appropriately. It also includes being adaptive – absorbing new threat information and adjusting to changes in the business and technology environment to keep eyes on what matters most.

- **Resilience**. This is a focus on damage control and repair, ensuring post-attack recovery will be swift.

The balance of investment in secure, vigilant, and resilient capabilities will vary between organisations, and will need to be applied differently to the various areas within an organisation.

That said, effective cyber security programmes should have the following characteristics:

- **Executive-led**. Executive leaders must set the stage by defining cyber risk management priorities, appetite, and mechanisms of accountability. Support from the top is essential in ensuring that diverse groups and department collaborate. The board risk committee's charter should also be expanded to include the mandate of how the organisation should be allocating resources to managing cyber risks. Directors can also lead by creating a board cyber-chair to oversee cyber/tech-related management activities and ensuring that the appropriate senior management is focused on the matter.

- **Involve everyone**. Although specific roles need to be defined, the programme is not the sole responsibility of a single part of the organisation. It requires broad horizontal and vertical participation, and behavioural change throughout the organisation to ensure success.

- **Long-term, not knee-jerk projects**. Although it usually requires a series of projects to get off the ground, such programmes require continuous review and improvement cycles to adapt to changes in the business risk and threat landscapes.

- **Comprehensive and integrated**. The secure, vigilant, and resilient elements are not distinct silos of activity; they are a set of lenses through which every essential business process and growth initiative should be evaluated or planned. Each involves people, process and technology components. When done well, each will improve the others.

- **Reach beyond your walls**. A company's ecosystem includes various partners, suppliers, and vendors; significant cyber incidents directly impacting these organisations may also substantially affect the company.

Becoming secure, vigilant, and resilient requires that the organisation embrace a fundamentally different view of what was previously called "security". Yesterday's security programmes were often perceived as a burden, an externally-imposed set of restrictions, rules, and procedural hurdles that impeded business initiatives. In the pace of today's climate, organisations cannot afford to be lead-footed simply because it cannot be perfectly secured.

One cannot secure everything equally; understanding the need to define 'crown jewels' allows the company to make better risk decisions without getting caught up in noise. Being secure means focusing protection around the risk-sensitive assets at the heart of your organisation's mission.

The essential truths

In summary, there are realities of cyber threats that needs to be recognised:

1. No industry is immune. Every company's information network will be compromised. It is not a question of if it will be at risk but rather when and how it will manage.
2. Cyber damages go beyond dollars. The long term effects on reputation, brand and morale, are significant and take their toll on organisations.
3. Speed of attack is increasing and response times are shrinking. Small highly skilled groups exact disproportionate damage and threat rate is increasing while the response window shrinking.
4. Everything cannot be protected equally. Understanding the need to define 'crown jewels' allow you to make better risk decisions without getting caught up in noise.
5. Traditional controls are necessary but not adequate. A company's protection networks and firewalls are probably high enough but it is always important to look at detective controls and new technologies.

Boards should bear these essential truths of cyber threats in mind and need to proactively ask questions of management, champion education and awareness programmes company-wide, and treat risk as a priority, because the financial, operational, legal, security, and reputational risks posed by cyber threats are far too serious to ignore. The peril of cyber threat will continue to be present and the first step to averting it lies with the board and their commitment towards managing cyber risk. ■

[1] Gemalto's 2014 Breach level index
[2] Verizon's 2015 Data Breach Investigations Report
[3] Moore's law states that processor speeds, or overall processing power for computers will double every two years.
http://www.mooreslaw.org/

HUMANISING TECHNOLOGY FOR A TRULY PAPERLESS BOARDROOM

Al Percival, Managing Director, Asia Pacific, Diligent Corporation

Going by the amount of information that is distributed to board members before each board or committee meeting, it is little wonder there have been more and more urgent calls to "go paperless".

The paperless boardroom can soon become a reality, if boards conduct thorough planning and focus on delivering the full benefits of digitisation to end users i.e. to themselves.

Getting rid of paper or getting rid of problems

Any attempt to reduce paper in the boardroom needs to begin with the understanding that going paperless actually occurs along a spectrum.

On one end is the traditional: 100 per cent paper environment, in which paper packs and all other information are distributed to board members in hard copies.

On the other end of the spectrum, you have the board that relies on a board portal – a secure third-party app through which board members synchronise their tablets or PCs to access a digital version of the board pack, which they can then annotate, discuss and vote using digital tools.

In between these two ends of the spectrum are intermediate points like emailing documents or using a file-sharing system. These half-way solutions are not as paperless as they may seem and even if board materials are distributed digital. Many problems of traditional distribution persist: PDF files and desktop documents are not very reader friendly.

Board portals can provide a solution to this "paperless paradox". A board portal, however, are not a silver bullet because it requires a well thought-out transitions based on a clear understanding of how information is distributed to and used by the board, and a focus on the human elements of the change.

Transitioning from a paper-full to a paperless boardroom

So how can boards make board portals deliver on their paperless promise?

The first step is to get buy-ins from the chairman, CEO and company secretary. The success of a paperless transition is not a matter of technology but rather one of changing habits. And asking a group to change the way it gets its board information requires a clear signal of support from the top as well as champions who will lead by example in their own use of the portal.

> **"**The success of a paperless transition is not a matter of technology but rather one of changing habits**"**

Humanising technology for a truly paperless boardroom

One such organisation which did so was US-based Gwinnett Medical Center. Its Chairman, David McCleskey, realised that working with hard copy board packs, which could weigh as much as 2.5kg, was more than an inconvenience. "Just wading through the paper slows down your ability to hone in on what's important for policy creation," he noted. He sought a solution that would help his board become faster and more efficient and reliable when it came to policy creation.

When the board and management are convinced, it is time to move into mapping the information flow. This is to ensure the paperless platform is rightly sized for the company and that a board portal is able to handle needs from all levels – from the main board to the multi-layered committees.

A good paperless implementation starts with a solid understanding of how and when the board packs are presently compiled, distributed and updated. After mapping out each step, the new paperless platform is then designed to replicate the current process as closely as possible. That might seem ironic, but one way paperless systems can fail is by trying to be revolutionary from the start rather than evolutionary. Once everyone gets comfortable with the board portal and what it can do, people will naturally begin to discover improvements to the workflow in a way that makes sense for their organisation.

A major determinant of whether or not a paperless portal takes hold is the quality and thoroughness of training given to the portal's administrators and users. Training for the directors and board members typically is straightforward and often is conducted over the phone.

Personalised training allows each to get comfortable with the portal at their own speed. No matter how busy directors are, they will appreciate the option to test the system in private, get all their questions answered and go into the first paperless meeting fully prepared.

Conduct all training for directors shortly before their first paperless board meeting. This ensures that everyone gets up to speed at the same time, is able to access the materials prior to the meeting, and is confident in their skills in using the portal when the meeting takes place.

Training and consulting with the administrators of the portal – usually the executive assistants in the CEO's office or the secretariat team charged with managing the current system – is essential for a smooth implementation. It is the administrators, after all, who upload the raw documents and then insert the various functions that make the digital documents so easy for the directors to use.

While most portal systems are highly reliable, questions do arise, often at inopportune moments (such as when a director is having connectivity problems while trying to sync documents before boarding a plane.). This is why it is important that the portal provider includes 24/7/365 support from a team of "always on" live experts.

Similarly, no matter how smoothly the implementation goes, follow-up training should be scheduled. This is particularly true for the administrators who will be able to utilise the full investment in the portal only when they become 100 per cent familiar with all its capabilities.

Not all information should be treated equal

The vast majority of documents in a board pack are on standard size paper, with dimensions that transition easily to being read via an app on a tablet. But a board pack might need to include larger-format documents that don't lend themselves as well to tablet viewing.

One city council in Australia that adopted a board portal took a two-pronged approach to the detailed financial statements, drawings and architectural plans their packs needed to include. The council distributed these documents in both hard and digital copies. They then brought in large flat-screen monitors for the council meeting and used them to display the larger documents at the appropriate points in the agenda. In this way, they continued to reinforce the overall migration to paperless working without forcing paperlessness where it could have compromised readability.

It is natural to think that there will not be any paper at the first paperless board meeting, but the transition needs to be less abrupt to maximise the chances for success. It is a good idea to either distribute the hard copy packs before the meeting as usual, or have copies in the boardroom to which directors can refer.

After the meeting, poll the directors individually about whether or not they still want to receive hard copy packs. If training has gone well, most directors will find they have little use for paper packs after the first paperless meeting. When a leading UK energy supplier implemented a board portal system, they found the transition so natural that they went from using paper one week to being paperless the next.

Prior to the first board meeting using a portal, some the directors of Lonmin, a UK-based mining company, still requested paper copies. Rob Bellhouse, Lonmin's Company Secretary found, however, that those requests faded after the first meeting. "After they got to use the solution and experience for themselves how easy it was, the take-up was very fast," he said.

Even if all goes well, it isn't unusual to have a director or two who wants to continue to have hard copy packs delivered after the first paperless meeting. As the rest of the board becomes more comfortable with the portal the holdouts will find that it takes them longer than their digital counterparts to navigate between sections and find the comments they want to share during the discussion. As board meetings begin to run more quickly and efficiently, the holdouts will not want to be responsible for slowing things down.

When a leading insurance company in the Netherlands switched to a digital board portal, a few board members insisted on using hard copy. But after a few months of watching everyone else using a board portal, on their iPads, they abandoned paper without looking back.

Making the paperless boardroom a reality

The paperless workplace has been a much-pursued goal for almost as long as there have been computers in the office. For decades, partial solutions that demanded too much compromise from the user kept that goal easily imaginable but ultimately unachievable. The development of board portals combined with powerful, easy-to-use tablets has finally made paperlessness and the efficiency it brings possible in the boardroom. Those who make the transition – and keep the user at the centre of the change – are likely to find that it delivers on its long-held promise. ∎

CREATING A MOBILE EXPERIENCE FOR DIRECTORS

Joe Ruck, President & CEO, Boardvantage

More so than ever before, directors are inundated with board work on top of fulfilling their full-time obligations to their companies. Help is on hand with a number of solutions available for the electronic boardroom.

Bring on the board portal

A board portal is a secure app or website designed explicitly for the purpose of facilitating information between directors and the company. It helps the board – regardless of its industries or size of business – save time, reduce costs and create efficiencies in the short and the long term.

Paperless capability is the first virtue no doubt but a board portal presents far more compelling reasons for executives to make the switch from paper to computer.

Having the board book on a director's iPad creates a potential risk because directors may forget to purge this information, or the device may be lost or stolen. This risk is addressed with a central control system that can purge content remotely.

A big part of board communication is about who sees what and when they see it. For example, what members of the audit committee see is often different than what members of the nomination committee see. Many board portals have a control matrix and content segregation, which makes it easy to control user access.

The rich graphics and animation of a board portal improve a director's entire boardroom experience, when compared to paper. It is more engaging, more satisfying, and ultimately more efficient.

For years, the board portal was a one-way communication tool. The company secretaries distributed materials and directors retrieved it online. Today, portals are shifting to two-way interactive capabilities, which improve decision-making by allowing directors to communicate back to the company secretaries in real time on the substantive issues, thus providing greater efficiency.

> **"**The 24x7 business environment has reset expectations for executive communication**"**

Making it mobile

For those directors that always on the move, a truly mobile board portal is the way to go. Such a mobile solution would need to:

- Allow the director to go offline
  Geographic dispersion and the popularity of the iPad have convinced directors to rethink long-standing email and paper process with initiatives such as "leave the laptop behind" or "go paperless". Underneath these efforts lies a common theme: the need to go mobile. It is common to think of mobility as synonymous with being online, but as business travellers know, network access is spotty on the road, and often unavailable in conference settings. Delivering a good user experience means creating an offline capability, but that capability needs to be designed around a seamless online/offline experience. Without that capability, the system will not find acceptance among directors.

- Be visually appealing
  A thorny challenge in software development is screen size limitations of mobile devices. It is doubly difficult to convey complex information so common in the boardroom. What further compounds the challenge is that directors usually are not open to spending time learning new tools. Yet, when they access the system, they still expect to locate what they need – promptly and efficiently. The best way to bridge that gap is to make their experience visual. A visual presentation lets the user absorb information quicker and makes complex information actionable even from something as diminutive as a smart phone. On mobile devices, graphics and animation are the key to overcoming screen size limitations.

- Put the context in the content
  A rich interface goes hand-in-hand with a good experience, but before directors will relinquish long-standing process, they require productivity improvements in their day-to-day activities. For board members, that means introducing context along with content throughout their environment. Individual documents can be presented in the context of an agenda. A current meeting can be presented in the context of a timeline of previous meetings and events can be presented in the context of a calendar. For directors who are often overloaded with information, contextualising will provide the productivity increase that many look for today.

- Support the business process
  The 24x7 business environment has reset expectations for executive communication. Always on the go, they need process continuity, whether in meetings or in between, in the office or on the road. The fact is that it is continuity that drives efficiency, but more importantly, continuity also accelerates the decision-making process, which requires more than passive document sharing. What is important is to offer a range of productivity tools that can capture the typical process executives are involved in: web conferencing to let them present at remote meetings, approvals for green-lighting initiatives or eSigning agreements, and secure email to support the need for one-on-one communication. They all share the same objective – driving process while on the go.

Creating a mobile experience for directors

A platform for growth

As the use of mobile devices among board members increases, the hard copy board book has been rendered a relic. As a result, board members are completing their board work more efficiently, since they are able to work away from the home or office using an electronic solution that is purpose-built for their needs.

That said, board portals are not just for board members. They are for the likes of executive leaders too. Many board portal companies offer a SaaS solution for executives and senior leadership that allows them to increase meeting productivity and process visibility.

As we move into the future, board portals and other software solutions will become more pervasive, as more companies strive towards software solutions that save time and make process outcomes more timely and predictable. ∎

SECTION
SEVEN

Innovation Gallery

Innovation Gallery

PRESENTED BY Singtel

EXHIBITORS

ETPL A*STAR

ASTROSCALE

Boardvantage

COINHAKO

Coursepad
Learn Do Share

CROSS TRACK

CROWDO

Deloitte.

Diligent

fetch+

FireEye
SECURITY REIMAGINED

garuda robotics

green koncepts
Making Energy Management Simple

HANDSHAKES

HOPE technik

HUTCABB SERVICES

IHiS
Because IT's in Healthcare

ncs
making IT happen

ntuc income

numoni

NUS
National University of Singapore

SCIENCE CENTRE

Singapore POST

SMART
Singapore–MIT Alliance for Research and Technology

TapTalents

TEDx Singapore
x = independently organized TED event

tradegecko

TradeHero

trak-matic

Trustwave
Smart security on demand

Volunex
ignite your creativity

WE ARE SPACES
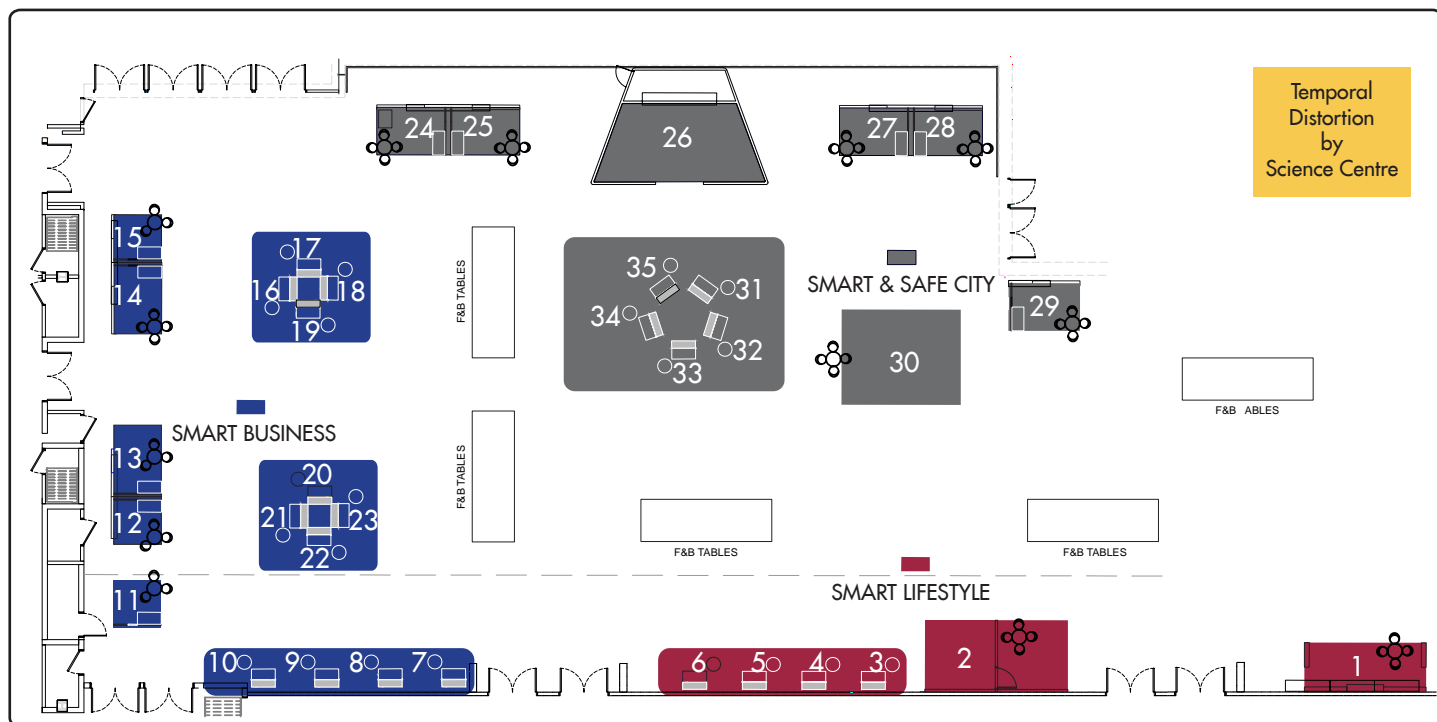
01. A*STAR ETPL
02. Singtel (Smart Home)
03. CoinHako
04. NTUC Income
05. Numoni
06. TradeHero
07. Coursepad
08. CrossTrack
09. Crowdo
10. Fetch Plus
11. Deloitte
12. Boardvantage

13. Singtel (Geo-analytics)
14. Diligent
15. IBM Business Partner
16. HuttCabb
17. TapTalents
18. TradeGecko
19. Handshakes
20. We Are Spaces
21. HOPE Technik
22. Garuda Robotics
23. Volunex
24. SingPost

25. FireEye
26. NCS
27. Singtel (Cyber Security)
28. Trustwave
29. IHiS
30. SMART
31. TEDx
32. Trakomatic
33. Astroscale
34. Green Koncepts
35. NUS - Department of Architecture

A*STAR ETPL

Booth : 01

ETPL is the commercialisation arm of the Agency for Science, Technology and Research (A*STAR), Singapore's lead agency for fostering world-class scientific research and talent.

Also known as Exploit Technologies Pte Ltd, ETPL's vision is to be the one-stop innovation partner of choice to grow businesses in Singapore and beyond, by translating the inventions and intellectual capital from A*STAR's research institutes into marketable products, processes and services. ETPL bridges the gap between research and market through building strategic partnerships, facilitating licensing deals and nurturing spin-offs. This is achieved by working closely with scientists and industry players to understand business needs and developing promising technologies that enable enterprises to harness new technologies as a competitive strategy.

In so doing, ETPL accelerates innovation and supports A*STAR in building a research ecosystem that benefits business, industry, economy and, eventually, society.

Website: www.etpl.sg

Astroscale

Booth : 33

Astroscale is a Singapore based private space company that is developing space debris removal solutions.

Its mission is to address the growing threat coming from space debris by incubating on-orbit services, which include Active Debris Removal (ADR) technologies.

The company actively participates in projects aimed at raising public awareness about space environmental issues. In order to make space more approachable for people, the company provides technological support as well as the global alliance necessary for private companies to be involved in space missions.

Website: www.astroscale.com

Boardvantage

Boardvantage

Booth : 12

Boardvantage leads the market in delivering paperless process for boards and committees.

Directors can e-sign documents, approve meeting minutes, share annotations, or utilise an array of other tools to manage their day-to-day work. Boardvantage also captures complex meeting process online. With dedicated workflows and support for last-minute updates, board secretaries can streamline meeting preparation and follow up, increasing productivity.

Trusted by enterprises worldwide, including half of the Fortune 500 companies, Boardvantage raises visibility and makes process outcomes more timely and predictable. Boardvantage is used by some of the biggest companies in Singapore, such as Singapore Airlines, Singapore Management University and Banyan Tree.

Website: www.boardvantage.com/sg

CoinHako

COINHAKO

Booth : 03

CoinHako is a Bitcoin brokerage business that has processed millions of dollars in volume since its inception in end 2014.

It is the first service in Asia to have reserves insured against theft and hacking attempts, allowing users to transact with peace of mind.

CoinHako's engineering team is also focused on innovations in Bitcoin's underlying technology, the Blockchain, which was awarded a winning position at the inaugural Blockchain hackathon organised by DBS Bank in Singapore. In addition to exploring licensing of this technology to compliance divisions of banks, CoinHako is working with partners to expand its brokerage and security services in Asia. CoinHako's technological capability and business acumen have attracted financing from investors in Silicon Valley – namely Tim Draper, Josh Jones and Boost VC.

Website: www.coinhako.com

Coursepad

Coursepad
Learn Do Share ™

Booth : 07

Coursepad is a mobile talent management platform that delivers personalised learning reminders, content and activities to keep your team in sync on key business processes.

Coursepad's cross-platform mobile talent management solutions deliver personalised learning reminders, content and activities to keep teams in sync on key business processes and skills they require for optimal performance.

Unlike other alternatives, our bite-sized personalised content and reminders accompanies your team wherever they go and ensures that everyone moves in sync.

Coursepad helps organisations adopt innovative mobile learning solutions and have conceptualised and developed solutions for organisations like Standard Chartered Bank, the Civil Service College and Sharma Leadership International. It was awarded the ACE Startup Grant and was chosen as the Most Innovative Startup in the IdeasInc Business Competition in 2013.

Website: www.coursepad.com

CrossTrack

Booth : 08

CrossTrack is an online and mobile marketplace that helps customers crowd-source for the most suitable couriers for their delivery jobs.

In the perfect world of CrossTrack, all deliveries will be done "along the way" by people who are already on the road, such as taxi drivers, salesman, and employees going home from work. This opens opportunities to earn supplemental income to industrious individuals who may have special income needs.

The CrossTrack process – from payment, courier assigning, and signature acquisition to document generation – is automated by CrossTrack from the point a customer makes a request online.

Website: www.crosstrack.sg

Crowdo

CROWDO

Booth : 09

Crowdo is Southeast Asia's largest and fastest-growing crowdfunding operator headquartered in Singapore.

Established in 2012, Crowdo is distinctly positioned as a regional player offering a full portfolio of crowdfunding solutions including Equity Crowdfunding and P2P Lending. It has a strong regional presence with operations in Singapore, Malaysia and Indonesia.

As a leading fin-tech start-up, its mission is to become the region's preeminent digital financial services firm connecting Asia's brightest start-ups with global smart capital. It is recognised as a leading brand within the industry in Asia and by regional and international media.

Crowdo's Management Team comprises fin-tech professionals with over 30 years of combined experience in the finance, technology and innovation space with backgrounds from world-class professional firms, corporations and financial institutions.

www.crowdo.com

Deloitte

Deloitte.

Booth :11

Deloitte provides audit, consulting, financial advisory, risk management, tax and related services to clients spanning multiple industries.

Deloitte Singapore is part of Deloitte Southeast Asia, a member firm of Deloitte Touche Tohmatsu Limited, comprising practices in Brunei, Cambodia, Guam, Indonesia, Lao PDR, Malaysia, Myanmar, Philippines, Singapore, Thailand and Vietnam. With 270 partners and 6,300 professionals in 24 offices, the subsidiaries and affiliates of Deloitte Southeast Asia combine their technical expertise and deep industry knowledge to deliver consistent, high quality services to organisations in the region. All services are provided through the individual country practices, their subsidiaries and affiliates, which are separate and independent legal entities.

Globally, Deloitte has a connected network of member firms in more than 150 countries with more than 210,000 professionals are committed to making an impact that matters.

Website: www.deloitte.com.sg

Diligent

Diligent

Booth : 14

Diligent is the leading provider of secure corporate governance and collaboration solutions for boards and senior executives.

The Diligent Boards solution (formerly Diligent Boardbooks) speeds up and simplifies how board materials are produced, delivered and collaborated on using iPads and Windows, removing the security concerns of doing this by courier, email and file sharing.

Over 3,100 clients in more than 60 countries and on all seven continents rely on Diligent to provide secure, intuitive access to their most time-sensitive and confidential information, ultimately helping them make better decisions.

Diligent is a publicly listed company with nearly US$90 million in annual recurring revenue, based on previously reported revenue retention rates (NZX: DIL).

Website: www.diligent.com

Fetch Plus

fetch⁺

Booth : 10

Fetch Plus is an award winning content aggregator and advertising platform used across Asia Pacific by some of the largest media companies and telcos to power their digital content directories and SME digital marketing toolkits.

Through its technology, Fetch Plus has generated millions in annual recurring advertising for its partners, served content and advertisement to Facebook users and solved pain points for media publishers and telcos transitioning to digital solutions.

The company's clientele includes Fairfax Media, Seven West Media / West Australian Newspapers, SingTel and The Globe. It has been featured in Inc., Entrepreneur, The West Australian, The Daily Mail, The Straits Times and has named one of seven companies to watch by Tech Crunch.

Website: www.fetchplus.com

FireEye

Booth : 25

FireEye's Threat Prevention Platform is a purpose-built, virtual machine-based security platform that provides real-time threat protection to enterprises and governments worldwide against the next generation of cyber-attacks. These highly sophisticated cyber-attacks can easily circumvent traditional signature -based defenses, such as next-generation firewalls, IPS, anti-virus, and gateways.

The FireEye Threat Prevention Platform provides real-time, dynamic threat protection without the use of signatures to protect an organisation across the primary threat vectors and across the different stages of an attack life cycle. The core of the FireEye platform is a virtual execution engine, complemented by dynamic threat intelligence, to identify and block cyber-attacks in real time.

FireEye has over 3,400 customers across 67 countries, including over half of the Fortune 500.

Website: www.fireeye.com

Garuda Robotics

Booth : 22

Garuda Robotics is a leading drone/UAV solutions provider based in Singapore. The company builds integrated hardware and software systems to enable the new wave of unmanned aerial vehicles (UAV) applications and services.

The Garuda Cloud is a fully web-based drone control and data intelligence platform accessible from any browser. It provides a fully automated way to capture aerial data from a variety of UAVs. The system is then able to apply advanced analytics and computer vision algorithms to the drone aerial data to generate immediately actionable insights for companies.

Garuda Robotics operates across Southeast Asia in the agriculture, building management, and security industries.

Website: www.garuda.io

Green Koncepts

green koncepts
Making Energy Management Simple

Booth : 34

Green Koncepts is a Singapore-based technology company committed to making energy management simple. It drives energy efficiency in the urban environment through disruptive innovation and collaboration.

Energetix™, its award-winning cloud energy management solution suite, provides industry-specific solutions to increase sustainability and reduce utility costs for cities, buildings, data centres, offices and homes. With affordable solutions developed on an open, scalable and interoperable platform, Green Koncepts helps customers make data-driven decisions to proactively manage their energy consumption for cost-effective, efficient and streamlined operations.

Green Koncepts' goal is to cultivate energy smart behaviour in the communities we work and live in, helping them work together to build a sustainable and liveable future.

Website: www.greenkoncepts.com

Handshakes

HANDSHAKES

Booth : 19

Handshakes is a dynamic platform that provides access to curated and disambiguated corporate information and keeps track of companies in Singapore, Malaysia and Hong Kong.

Through IPO prospectuses, corporate disclosures, annual reports, news releases and directors' declaration, Handshakes maps out relationships between companies and persons within the business ecosystem, allowing banks, capital markets professionals, regulators and researchers to gain insight into any company or person within the region.

Website: www.handshakes.com.sg

HOPE Technik

technik

Booth : 21

Established in 2006, HOPE Technik provides complete engineering solutions to clients demanding high performance unique solutions – from product conceptualisation and prototype development to mass production.

A 50,000 square feet three-storey factory by HOPE Technik has been allocated to engineering cells to differentiate projects, design a solution, build functional prototypes to test the concept and translate them into a production run to meet client demands.

HOPE Technik's area of expertise in engineering research and experimental development spans from robotics, unmanned systems, autonomous vehicles (UAV,UGV,USV) and vehicle building for the defense, security and rescue, logistics and medical sectors.

Website: www.hopetechnik.com

HutCabb Services

HUTCABB SERVICES

Booth : 16

HutCabb Services helps its clients create better business opportunities and lend them a platform to achieve higher quality of life through Internet of Things (IoT).

Being a thought leader in IoT, HutCabb consistently delivers solutions that reduce costs for its clients, improve efficiency and raise productivity and enhance competency and enable consistency. It provides the insights required for businesses to be successful.

In recent years, HutCabb has collaborated with Singapore's Agency for Science, Technology and Research (A*STAR) and the Institute for Information Industry (III, Taiwan) to develop IoT solutions for remote healthcare monitoring to support the Silver Industry. This portfolio of products enables step-down care to be Measured, Moderated, Monitored, and Maintained – so as to reduce the workload for professional care-givers. HutCabb plans to build mobile apps and wearable solutions which are aimed at enabling Smart Homes.

Website: www.hutcabb.com

IHiS

Booth : 29

IHiS architects and manages highly integrated systems across Singapore's public healthcare sector. It transforms patient care through innovation and excellence in technology.

IHiS supports more than 40,000 healthcare staff at all the public hospitals, national specialty centres and polyclinics under the umbrella of the public healthcare clusters – National University Health System, National Healthcare Group, Singapore Health Services, Alexandra Health System, Jurong Health Services and Eastern Health Alliance.

IHiS has garnered more than 40 awards for its smart technologies, and played a key role in six Singapore hospitals becoming amongst the first public institutions in Asia Pacific to achieve HIMSS EMRAM Stage 6, an international benchmark for advanced technology used in patient care.

Website: www.ihis.com.sg

NCS

Booth : 26

NCS is a leading infocommunications technology (ICT) service provider.

Together with Singtel's Group Enterprise, it is present in over 20 countries throughout APAC, Europe and the USA.

NCS delivers end-to-end ICT solutions to help governments and enterprises realise business value through the innovative use of technology. Its unique delivery capabilities range across consulting, development, systems integration, outsourcing, infrastructure management & solutions and portal management. It also provides mobility, social networking, business analytics and cloud computing services.

Website: www.ncs.com.sg

NTUC Income

ntuc
Income

Booth : 04

NTUC Income was established in 1970 to provide affordable insurance for workers in Singapore. Today, two million people in Singapore look to NTUC Income for trusted advice and solutions when making their most important financial decisions. Our wide network of advisers and partners provide life, health and general insurance products and services to serve the protection, savings and investment needs of customers across all segments of society.

As a social enterprise, NTUC Income was made different. Our social purpose is to make insurance accessible, affordable and sustainable for all. Putting people before profits, we strive to create and maximise value for customers.

In 2014, NTUC Income had over $32.6 billion in assets under management. Our financial strength and diversified investment portfolio is reflected by our strong credit ratings which underpin the delivery of our commitment to customers.

NTUC Income's corporate social responsibility initiative, OrangeAid, focuses on children and youth, especially the disadvantaged.

Website: www.income.com.sg

Numoni

numoni

Booth : 05

Numoni Pte Ltd is a Singapore technology company that embraces innovation.

Numoni has created, designed and developed user-friendly, self-service Nugen Bank-in-the-Box vending machines that enable micro-transactions such as topping up mobile credit and micro remittances to be performed. This technology rides on the new wave of mobile payments.

These machines allow foreign workers and others to top up their prepaid mobile airtime or do the same for their families in their home countries. All these are made possible from Nugen machines placed strategically in dormitories, convenience stores and education institutions all around Singapore. With this breakthrough technology, Numoni has been able to inhabit the space of people without bank accounts.

More than 80 per cent of the world remains underbanked. Numoni is committed to promote financial inclusion for the underbanked by empowering them to make e-transactions effectively, safely and conveniently.

Website: www.numoni.com

Innovation Gallery

NUS – Department of Architecture

Booth : 35

NUS is a research-intensive university with an entrepreneurial dimension. The Department of Architecture has more than 50 Years of established benchmark in professional architectural education excellence.

Tay Kheng Soon is an architect at Akitek Tenggara and an NUS Adjunct Professor. His work has always been in design research to design a better world. This earned him the SIA Gold Medal and his election as a Fellow of the World Academy of Art and Science.

His current concern is with modular urbanisation. His proposition is Modular Cities at 100,000 population each, at plot ratio of 5:1 in one square kilometre which can be deployed singly or clustered anywhere in the world. It rebalances the mechanised and the humanised economies to address human deprivation and environmental degradation and provides opportunities for multi-trillion dollar investments to jumpstart the stagnated global economy.

Website: www.arch.nus.edu.sg

Science Centre

Temporal Distortion

The Science Centre Singapore, a leading regional Science Centre, is celebrating 38 years of promoting interest and creative learning in science and technology in 2015.

The Centre has been a custodian of creativity and innovation, capturing the evolution of scientific developments through unique and relevant exhibitions and shows and continues to ignite young minds and foster new generations of scientifically savvy Singaporeans. Its interactive exhibits, housed in 14 galleries, cover a wide range of topics related to science, technology and mathematics. An additional 20,000 square metre of outdoor exhibition space showcases the Waterworks exhibition, Kinetic Garden and Ecogarden.

The Centre offers a wide range of enrichment programmes for students aimed at complementing the school's formal science education as well as enriching and fun events, competitions and outreach activities for all visitors.

Website: www.science.edu.sg

Singapore Post

Singapore Post

Booth : 24

Singapore Post (SingPost) is the leading provider of mail, logistics and eCommerce solutions in Singapore and the Asia Pacific region, with operations in more than 10 countries.

As Singapore's national postal service provider, for over 150 years, SingPost offers trusted communications through domestic and international postal services as well as end-to-end integrated mail solutions covering letter shopping, delivery and mailroom management, among others.

SingPost has been steadily expanding beyond Singapore, its regional network and infrastructure, offers fully integrated eCommerce logistics solutions covering freight, customs and regulations management, warehousing and fulfilment, last mile delivery and returns, as well as eCommerce web services, to its customers. SingPost's subsidiaries and businesses include SP eCommerce, Quantium Solutions, CouriersPlease, Famous Holdings, Lock+Store, Speedpost, vPOST, Omigo Marketplace and SAM.

SingPost won multiple international awards including World Mail Award for Retail Customer Access in 2015, Service Provider of the Year Award by Postal Technology International and the Universal Postal Union's EMS Cooperative Award for its Speedpost courier service.

Website: www.singpost.com

Singtel

Singtel

Booth : 02, 13 & 27

Singtel is Asia's leading communications group providing a portfolio of services including voice and data solutions over fixed, wireless and Internet platforms as well as infocomm technology and pay TV.

The Group has presence in Asia, Australia and Africa with over 550 million mobile customers in 25 countries, including India, Indonesia, the Philippines and Thailand. It also has a network of offices throughout Asia Pacific, Europe and the United States.

From driving business efficiencies and simplifying transactions to boosting security inside and outside of homes, Singtel has developed a growing suite of smart solutions which includes home sensing technologies, mobile payment and geo-analytics to cybersecurity and public safety monitoring.

Website: www.singtel.com

Innovation Gallery

SMART

SMART

Singapore–MIT Alliance for Research and Technology

Booth : 30

The Singapore-MIT Alliance for Research and Technology (SMART) is a major research enterprise established by the MIT in partnership with the National Research Foundation of Singapore (NRF) in 2007.

SMART is the first, and to-date only, MIT research centre outside the United States. It is also the school's largest international research programme. MIT faculty members have laboratories at SMART, mentor postdoctoral associates and graduate students, and collaborate with researchers from universities, research institutes and industries in Singapore and Asia.

The Autonomous Vehicle project at SMART has been ongoing for the past five years. The research team has fully developed the prototype autonomous car and golf buggies. Further, it has conducted several trials open to the public; notably, a six-day trial at the Chinese and Japanese Gardens in 2014.

Website: www.smart.mit.edu

TapTalents

TapTalents

Booth : 17

TapTalents redefines customer engagements and sales experiences for busy sales reps.

It has created a personalised on-the-job training platform that helps companies deliver critical industry and product knowledge to their remote field sales teams and sales representatives on their personal devices. The information provided is specific, important and relates directly to the sales task that the sales representative is working on at hand.

TapTalents has leveraged cognitive computing, mobile, and cloud technologies to create a user experience a mobile sales force will want to use. This makes the sales teams more effective, efficient, and productive. The system helps sales reps get smarter about their prospects, providing critical industry information and sales activities to perform, while making CRM updates painless and easy.

Website: www.taptalents.com

TEDx Singapore

TEDˣ Singapore

x = independently organized TED event

Booth : 31

TED and TEDx is a phenomenon of unprecedented scale in human history: Communities all around the world have come together to share ideas and explore possibilities. Since 2009, over 10,000 TEDx events have been organised globally including by The United Nations, Vatican and NASA.

Over the last 6 years, TEDxSingapore has grown a community of 70,000 people, curated 31 TEDx events, and spread the ideas of over 150 people across a myriad of backgrounds, from scientists, economists, architects, adventurers, photographers to poets.

In November this year, we are curating our most significant TEDxSingapore, thought-provokingly themed "The Undiscovered Country" to express the latent potential that lies within ourselves and Singapore, and to imagine possibilities for our collective future.

Website: www.tedxsingapore.sg

TradeGecko

tradegecko

Booth : 18

TradeGecko is a cloud-based inventory management platform for retailers and wholesalers that want effortless commerce.

TradeGecko is empowering retailers and wholesalers to become as fast and efficient as today's modern e-Commerce businesses. It does this by fusing inventory management operations, critical business applications and online commerce to build the central core of wholesale business operations.

Originally incubated in 2012 by JFDI, TradeGecko quickly grew to 60 employees with customers in over 100 countries and over US$1 billion in transactions. With a newly injected US$6.5 million in Series A by Jungle and NSI Ventures, TradeGecko is aiming to open offices in the US, AUS along with expanding its inventory and order management platform globally.

Website: www.tradegecko.com

Innovation Gallery

TradeHero

Booth : 06

TradeHero is a free-to-download stock market and currency trading simulation app, which draws real-world data from global exchanges and data partners. It is the world's first social investment network, founded in 2012 by Singapore-based app developer MyHero.

TradeHero works with financial partners – including Ayondo, hexun.com, Macquarie, Motley Fool, OANDA, PhillipCapital, Seeking Alpha, SGX, SinoLending and Snowball – towards a common objective of promoting financial education among a wider audience. It does this through tutorial videos, gamification, and via content partners.

TradeHero offers investment enthusiasts a social community where intelligent information and validated financial trading strategies are available for them to learn and replicate in real-life trading. Since its release, TradeHero has over 3.6 million downloads, and has been ranked the number one finance app in 91 countries, and in the top 10 in 127.

Website: en.tradehero.mobi

Trakomatic

Booth : 32

Trakomatic specialises in using advanced video analytics for people counting, path tracking, facial-based age and gender estimation. Its systems allows for the re-identification of customers and other stakeholders to optimise manpower allocation and operational efficiency.

Trackomatic analysis of the data captured helps business owner from retail, banking, tourism and transportation industry to make smarter and data-driven decision.

Trakomatic enables the traditional view of "dumb" CCTV devices to be effectively turned into smart sensors. Trakomatic's mission is to provide every retailer globally to understand about shopper behaviour in the easy manner.

Website: www.trakomatic.com

Trustwave

Trustwave®
Smart security on demand

Booth : 28

Trustwave helps businesses fight cybercrime, protect data and reduce security risk.

With cloud and managed security services, integrated technologies and a team of security experts, ethical hackers and researchers, Trustwave enables businesses to transform the way they manage their information security and compliance programmes.

More than three million businesses are enrolled in the Trustwave TrustKeeper® cloud platform, through which Trustwave delivers automated, efficient and cost-effective threat, vulnerability and compliance management.

Trustwave is headquartered in Chicago, with customers in 96 countries. In April 2015, Singtel announced plans to acquire Trustwave to strengthen Singtel's information security capabilities and bolster Trustwave's ability to expand its leadership in managed security services globally.

Website: www.trustwave.com

Volunex

Volunex
ignite your creativity

Booth : 23

Volunex Pte Ltd is a dynamic Singapore based company that started designing and manufacturing affordable, easy-to-use, robust and ready-to-print personal 3D printer. The Venus was first sold in 2013.

At Volunex, its dedicated team of multi-disciplinary engineering experts comes together to make quality and affordable 3D printers a reality for all.

Volunex's 3D printers allow users to explore their creativity and imagination to design and manufacture virtually anything and anywhere using 3D printing technology, advancing the world of 3D printing.

Website: www.volunex.com.sg

Innovation Gallery

We Are Spaces

WE ARE SPACES

Booth : 20

We Are Spaces is Singapore's leading online platform for corporate meeting and event spaces. Through We Are Spaces, planners can source, and get multiple quotations from venues within a centralised platform. To date, the platform has over 100 spaces and generated leads amounting to over S$8 million worth of event budget.

Most recently, We Are Spaces is an official partner of ZeGuestlist to provide a holistic range of event technology. Planners can now adopt ZeGuestlist offerings such as online RSVP, event applications and mobile check-in as early as during the venue sourcing stage.

Website: www.wearespaces.com

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Shedding light on Smart Governance

As Singapore transforms into a SMART nation, organisations need to be SMART in all aspects of how they do business – including controls and governance. A lack of controls can lead to risks that cause brand damage and even lost revenues.

Find out how you can leverage on smart technologies to improve the effectiveness of your Boards and read "Smart Governance in a Smart Nation – A Singapore perspective" at **www.deloitte.com/sg/smartgovernance.**

Deloitte.

Modernise the Boardroom.

The Diligent Boards™ solution provides the simplest, easiest user experience possible while never leaving the protection of the Diligent platform. In the era of BYOD, we balance security and control for the enterprise with mobility and productivity for its executives. Our own employees provide 24/7/365 expert support for administrators and end-users.

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PASSIONATE ABOUT *Chocolate*

PETRA FOODS
LIMITED

Established in the 1950s and listed on the Mainboard of the Singapore Exchange since 2004, **Petra Foods** has come a long way since its humble beginnings as a maker of chocolate confectionery serving a small community in Indonesia.

Today Petra Foods manufactures and distributes branded consumer products that are sold in over 17 countries including Indonesia, Singapore, Malaysia, Hong Kong, Australia, Thailand, the Philippines and China. Its flagship brands in Indonesia include "SilverQueen" and "Ceres" and its "Goya" brand is widely popular in the Philippines.

CORPORATE AWARDS

2003
SINGAPORE ENTERPRISE 50 AWARD
Enterprise 50 Awards

2005
SINGAPORE'S 15 MOST VALUABLE BRANDS
IE Singapore

2004
BEST NEWLY LISTED SINGAPORE COMPANY
AsiaMoney's Best Managed Companies Poll 2004

2013
MOST TRANSPARENT COMPANY AWARD, RUNNER-UP
Securities Investors Associations (Singapore) Investors' Choice Awards

2004
ENTERPRISE OF THE YEAR
20th Singapore Business Awards

2015
BEST MANAGED BOARD, BRONZE
Singapore Corporate Awards

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Left to Right (Front): Mr Melvyn Pun, Mr Serge Pun, Mr Adrian Chan
Left to Right (Back): Mr Andrew Rickards, Mr Basil Chan, Dato Dr. Amin Abdullah, Mr Kyi Aye, Mr Cyrus Pun
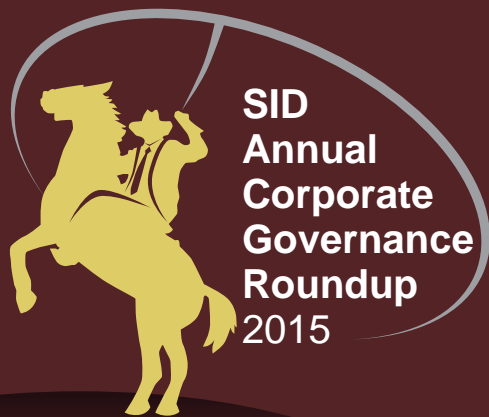
SID Directors' Conference 2016

DIGITAL DISRUPTIONS

SID Annual Corporate Governance Roundup 2015

Catch up with fellow directors and on the year's happenings at the **SID Corporate Governance Roundup 2015**

Date : Wednesday, 18 November 2015

Venue : Antica Ballroom, Orchard Parade Hotel

Program : 09.30 am   Registration / coffee

10.00 am   Annual Corporate Governance Roundup

12.00 pm   Lunch
Collection of *Boardroom Matters (Volume 2)*

1.15 pm   End of Annual CG Roundup event

SID members only:

1.00 pm   SID AGM registration opens

1.30 pm   SID Annual General Meeting commences

The Corporate Governance Roundup event is for those who want a quick refresher on the year's happenings and know what to expect in 2016 on key corporate governance and directorship matters. It is also an opportunity to meet up and network with fellow directors in a convivial atmosphere.

Most of the topics will be covered by SID Council members.

Cost: $60 for SID Members
$90 for non-members
All attendees will receive a complimentary copy of *Boardroom Matters (Volume 2)* worth $38.
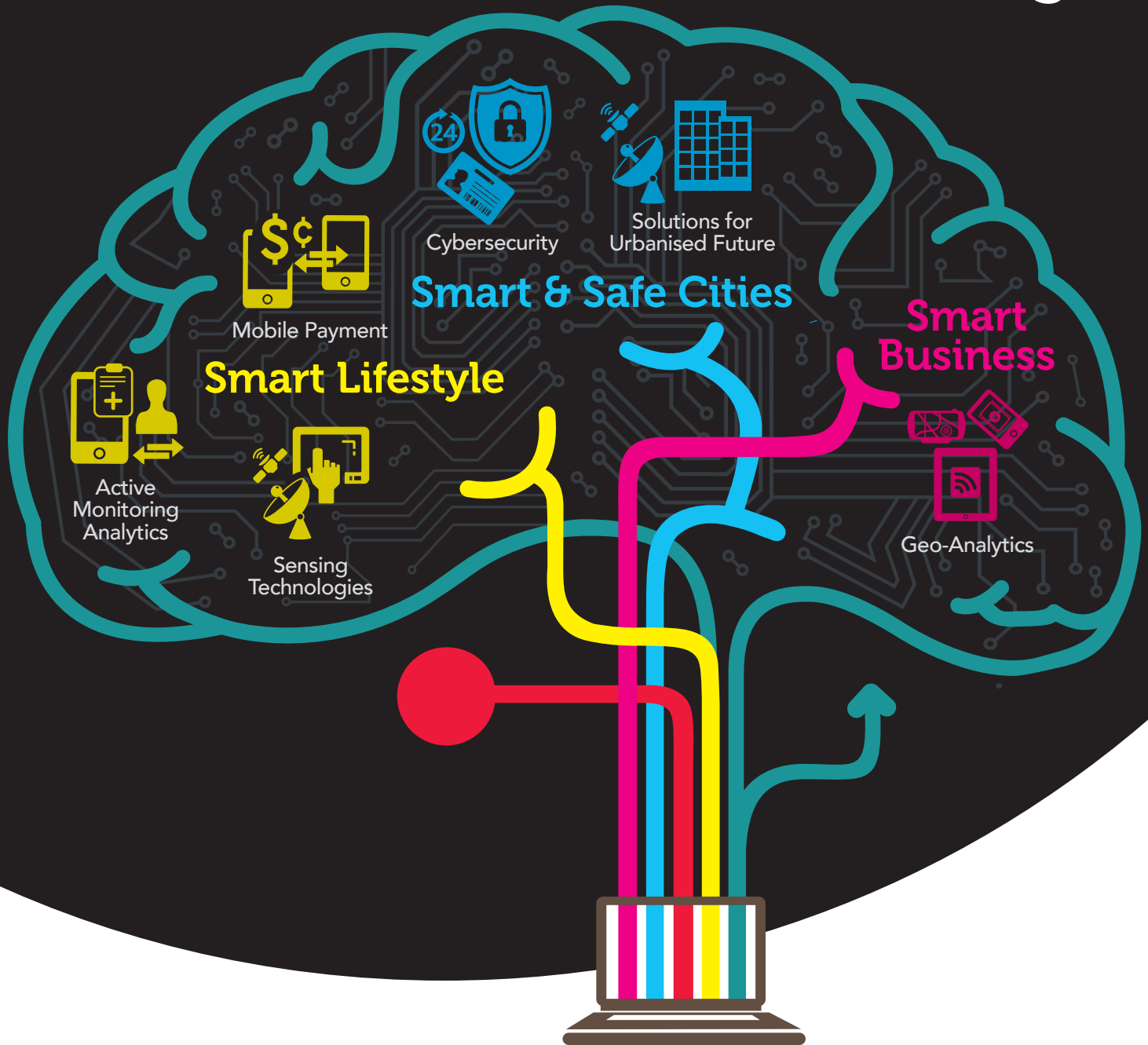
Register for the event at www.sid.org.sg

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Geo-Analytics

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Rapid developments in technology arising from globalisation and urbanisation are changing the way we live, work, play and communicate. Be it driving business efficiencies, simplifying transactions or boosting security inside and outside of homes, smart technology offers unbounded potential to improve our lives.

Our vision of the future is one where next-generation technologies enable a more vibrant and sustainable environment for individuals, enterprises and communities alike. This is underpinned by our growing suite of smart solutions that run the gamut from home sensing technologies, mobile payment and geo-analytics to cybersecurity and public safety monitoring.

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