

LEVERAGING INFOCOMM TO ENSURE SINGAPORE'S PROSPECTS IN THE FINANCIAL MARKETS

Report by the iN2015 Financial
Services Sub-Committee



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Preface

Singapore will host this year the Annual Meetings of the Boards of Governors of the International Monetary Fund and the World Bank Group. Playing host to an event of such global stature and scale reflects Singapore's standing as a vibrant financial services centre and in particular, Singapore's position at the crossroads of Asia.

This year also marks the 25th anniversary of Singapore's infocomm journey since it embarked on national computerisation in 1981 to become a thriving infocomm hub of international repute today.

Singapore's overall transformation did not happen by chance. It is the result of the vision of many who dared to dream and who continuously steered Singapore's transformation. Hence, when the Financial Services Sub-Committee embarked on setting out the directions for infocomm in financial services in Singapore, it was clear to us that our work and conclusions could impact Singapore's future.

This report summarises our deliberations over the last year. It sets out the Sub-Committee's key insights and outlines the broad areas where infocomm could make a difference to the financial services industry in Singapore.

The growth prospects for the industry are promising, as Asia, led by China and India, will be centre-stage for new opportunities. Against this background, it is imperative that we move decisively to establish Singapore as a trusted gateway to a new, emerging Asia and as a showcase for innovative financial services in Asia.

Over the next 10 years, new forces will disrupt the financial services landscape, challenging the status quo and market practices as we now know them. We must remain nimble, embrace change and capitalise on Singapore's thriving infocomm environment to ensure Singapore's position in the financial markets and at the crossroads of Asia. With this frame of mind, we present this report not as a roadmap but as a living document for continuous discussion and engagement on how we can leverage infocomm to redefine Singapore's future in financial services.

Together, we will realise the vision of transforming Singapore into "a trusted gateway to emerging Asia and an innovative hub for financial services, powered by infocomm".



Mr Jackson Tai

Chairman

iN2015 Financial Services Sub-Committee

iN2015 Financial Services Sub-Committee

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Mr Bill Chua	Executive Vice President, Delivery Channels & Operations United Overseas Bank Ltd
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Mr Peter Lam	Deputy Director, Manufacturing & Services Infocomm Development Authority of Singapore <i>(from April 2006)</i>
Mr Paul Lawrence	Chief Executive Officer, Singapore The Hongkong and Shanghai Banking Corporation Ltd
Mr Philip Lee	Managing Director, Senior Country Officer, Singapore JP Morgan Chase Bank, N.A.
Mr William Liu	President Green Dot Capital Pte Ltd
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Executive Summary

A confluence of developments will drive the transformation of global financial services industry over the next 10 years. Asia, powered by the growth of India and China, will alter global patterns of trade and investment and open new opportunities for the industry. As companies set up their presence in Asia, they will continue to rebalance their sourcing strategies and streamline business processes for greater competitive edge. Globally, financial markets are also going through intense competition and rapid market evolution. The continued demand for cross-border investments and the pursuit for greater liquidity will lead to further consolidation of global financial markets.

As financial services are information and technology intensive in nature, infocomm will play a key role in shaping the way the financial institutions transform their businesses and infuse their legacy operating models with unprecedented functionality. Singapore's strengths in infocomm and market infrastructure will provide a comparative advantage that should be tapped to capture the emerging opportunities in Asia. Singapore should transform itself into a **Trusted Gateway to emerging Asia** and an **Innovative Hub for Financial Services** through the use of infocomm. This is the vision of the iN2015 Financial Services Sub-Committee.

To realise this vision, the Sub-Committee recommends the following:

- **Develop Singapore into a Trusted Gateway to Financial Services in Asia**

More than other industries, financial services industry depends on trust. With a rising number of cyber-threats and increasing pressure for regulatory compliance, the importance of trust as a competitive factor to a financial services hub cannot be understated.

This calls for Singapore to further entrench its reputation as a trusted hub. To that end, the Sub-Committee supports the recommendation to put in place a comprehensive **National Trust Framework** programme to further

leverage infocomm to secure our electronic channels and set standards to ensure resiliency of our financial infocomm infrastructure. In addition, efforts will be put in to ensure quality and cost-competitive telecommunications infrastructure and build an innovative workforce with cross-disciplinary skills in infocomm and finance. It also entails attraction of high-end shared services into Singapore and the creation of new marketplaces for financial products.

- **Establish Singapore as a Centre for Infocomm Innovation in Financial Services**

Trust alone will not create a sustainable financial services industry. The ability to innovate and create new products, processes and services that anticipate and meet customers' increasing demands is key to being a sustainable premier financial services centre.

Leadership will be claimed by those adept at harnessing infocomm for product, service and process innovation to anticipate customer's needs. The Sub-Committee recommends that the Government create an environment for financial services to test and deploy new innovative technologies to enable change and address the needs of their customers. This will be done through deployment of iconic projects that use infocomm to deliver new financial services.

- **Enable Commerce through a Next-generation e-Payment Infrastructure**

To catalyse transactions across all sectors of the economy and potentially create new market spaces that were previously unserved, Singapore will invest in innovation of electronic payment solutions and put in place the necessary infrastructural pieces to provide convenient electronic payment solutions over different channels to users and businesses. Value-added services will be created to spur online transactions or bring greater convenience to end-users.

As part of an implementation plan, a suite of programmes are proposed to support the strategic thrusts outlined above:

- **I-Wealth Management**

Technological advances will enable basic wealth management services to be extended to the mass affluent to empower them to better manage their wealth. It will also allow premium financial advisory to be provided at a fraction of the cost compared with the current situation, and enable wealth managers to service more clients both locally and across Asia. This will extend the industry's capabilities in the areas of:

- Client service and advisory – to provide clients with multi-channel access and possibly a 360 degree view of personalised information across different asset classes
- Investment management and product development – to enable quicker time to market of innovative financial products and services and better risk management
- Back-office processing – to improve process efficiency and cut costs

The programme entails the collaboration of players in the wealth management value chain to implement innovative pilots and projects in areas such as 360° service delivery, paperless fund management, and paperless insurance. It would also require relevant agencies to review policies to facilitate data-sharing and enable straight-through processing.

- **Corporate Financial Information Exchange**

Increased economic, market and regulatory pressures are requiring companies to publish information to a myriad of internal and external stakeholders in greater frequency and variety of formats. Facilitating the flow of information and reporting creates greater transparency and a more efficient capital market. New electronic standards in corporate reporting will be adopted to streamline corporate financial reporting process, thereby facilitating financial analysis and providing consumers greater and faster access to financial information.

This programme requires efforts to co-ordinate taxonomy development of the standards for electronic reporting of financial information and promote its adoption by businesses.

To catalyse adoption, Government agencies should establish XBRL (eXtensible Business Reporting Language) as the standard for online regulatory and tax reporting and engage the industry to provide value-added services on top of the platform for the corporate community and individual investors through innovative pilots.

- **Next-generation Electronic Payments**

Building on an already pervasive adoption of electronic payments, this programme will continue to drive innovation in e-payment systems by leveraging on the latest technologies to reduce cost of transactions, increase process efficiency and enable growth of new market segments. Here, the Government will need to review policies, encourage adoption of open standards, promote stronger collaboration along the value chain players, and incentivise the development of new payment solutions. This will encourage deployment of more convenient electronic payment solutions which allow users to transact anywhere, anytime. It will open up new market spaces such as the mobile digital content market for more retailers and content providers to tap on.

- **National Trust Framework**

This programme, proposed by the Infocomm Infrastructure, Services and Technology Development (IISTD) Sub-Committee, will help to secure, protect and manage users' online assets, activities and identities, and entrench Singapore's reputation as a trusted business hub.

CHAPTER 1

FINANCIAL SERVICES LANDSCAPE IN 2015

Serving Asia from Singapore

Imagine the world in 2015, where Singapore will be one of the top three Knowledge Process Outsourcing / Offshoring hubs in Asia Pacific for the development and processing of financial services. As China and India drive the demand for financial services in Asia, Singapore can be the place where global financial services companies rebalance their sourcing strategy to serve their customers.

Financial services institutions can orchestrate the delivery of financial services from Singapore, leveraging on our capacity to manage high volume and time-sensitive transactions, and our expertise for higher value-added services such as fraud management. In other words, with our infrastructure and strong linkages with other major offshore centres in Asia, even if the front-end execution takes place outside Singapore, Singapore can manage and process key high value-added processes with unprecedented speed and quality of service. The centres in Singapore will also have access to the best talent and business partnerships to constantly innovate to serve the complex needs of their customers, both internal and external, in other geographies.

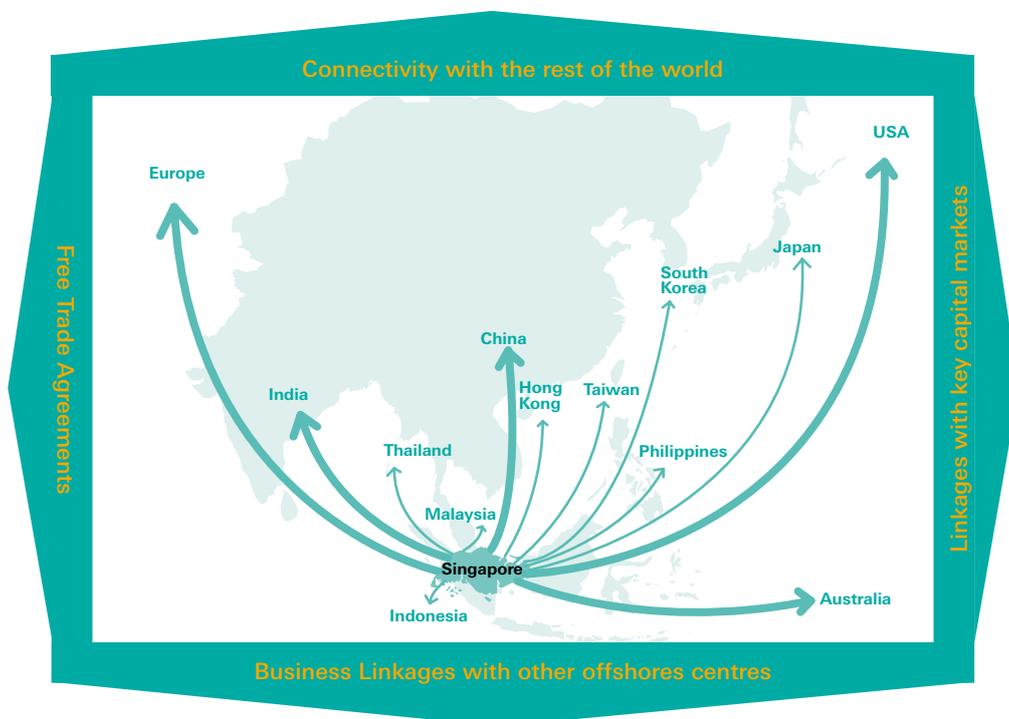


Figure 1-1: Singapore as a trusted hub to emerging Asia

Singapore will also be one of the top three marketplaces in the Asia Pacific for innovative financial products, as well as a key access point linking issuers and market makers to a broader range of trading and information services in the region. Singapore will lead in product innovations and technology standards in financial markets, and offer widespread connectivity to attract a diverse global customer base. New financial instruments and products will be created and traded in Singapore. With the establishment of linkages to other regional exchanges, Singapore will offer global investors greater access to a broader range of trading and information services in regional markets.

Infocomm Innovation in Financial Services

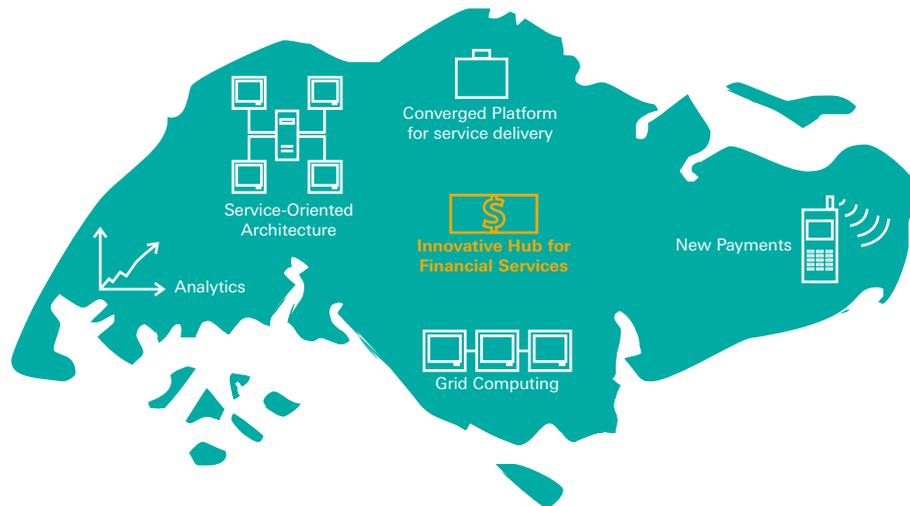


Figure 1-2: Singapore as an innovation hub for financial services

Imagine the world in 2015: Singapore will be a thought leader in the use of infocomm for financial services. Financial services institutions will turn to Singapore to leverage on infocomm to develop new capabilities to better serve their customers.

Here, they will have access to a much sought after group – techno-strategists with cross-disciplinary skills in infocomm and finance, to help them define complex problems in financial services and translate them into implementable IT solutions. They will also have access to ready technologies, provided by the pool of financial technology suppliers, to put together innovative services.

In 2015 where business will be real-time, workforce truly mobile, most transactions will be carried out online. Thanks to intelligent business search technologies that constantly provide synthesised, timely and customised information to the individuals, users now have personalised access to pertinent financial information wirelessly or through any electronic channels, wherever they are. Virtually all services are within the click of a button. Even talking to the advisor can be done virtually via the broadband phone, without leaving the doorstep.

When a user makes a transaction, it takes mere minutes if not seconds, for processes are automated and there are no more long pages of forms to fill in. Information is integrated seamlessly across different parties and different systems that were disparate 10 years ago, to complete the transaction.

This is possible because not only are all businesses and financial information compatible, but authenticated and trusted suppliers also have full access to all the data they need to operate efficiently. This in turn is possible because of the implementation of a National Trust Infrastructure that identifies and authenticates trusted parties, and promotes collaboration through harmonisation of business rules and frameworks.

Sales and operational transactions are captured, monitored and accounted for online by intelligent system sensors linked to the embedded financial analytical systems within the financial infrastructure. Any fraudulent operation is detected through the intelligence that is built into the system and the use of massive grid computing networks to audit the transactions.

Successful operations are analysed over time to provide deeper insights on the customers' needs and patterns so that the relationship managers can combine this new insight with streaming data integrated from different sources to shape tactical decisions and deliver personalised services to the customers.

This is not limited to just customers in Singapore. Relationship managers can interact with their overseas clients virtually via broadband video from Singapore, making use of broadband multi-media interactivity to better explain investment opportunities and propose new products and services. This further strengthens Singapore's role as a wealth management centre for Asia.

Imagine. In 2015, payment services are conveniently available across all channels. Users can transact with anyone, anytime, anywhere. As a result, commercial activities are not confined to brick and mortar shops or even websites. For example, an advertisement by the bus-stop can now interact with the users via wireless technologies. A user interested in watching a movie can buy tickets for it by flashing his phone over the flat wireless terminal at the advertisement panel, which can intelligently select the best seats based on his profile, confirm his booking and transmit his electronic movie ticket to him.

With just a click of the button, he can check how much he has spent that month, top up his electronic wallet attached to his phone, and even transfer money securely to a friend, through a wireless remote link to his preferred bank.

CHAPTER 2

OVERVIEW OF SECTOR

Performance of Financial Services Industry

The financial services industry constitutes a significant component of Singapore’s economy. There is a large number of local and foreign financial institutions numbering more than 500 in Singapore. The total assets of the financial institutions amounted to S\$1.55 trillion at the end of 2004, of which 61.6 per cent were Asian Dollar Market (ADM) assets and 29.6 per cent domestic banking assets (see Figure 2-1).

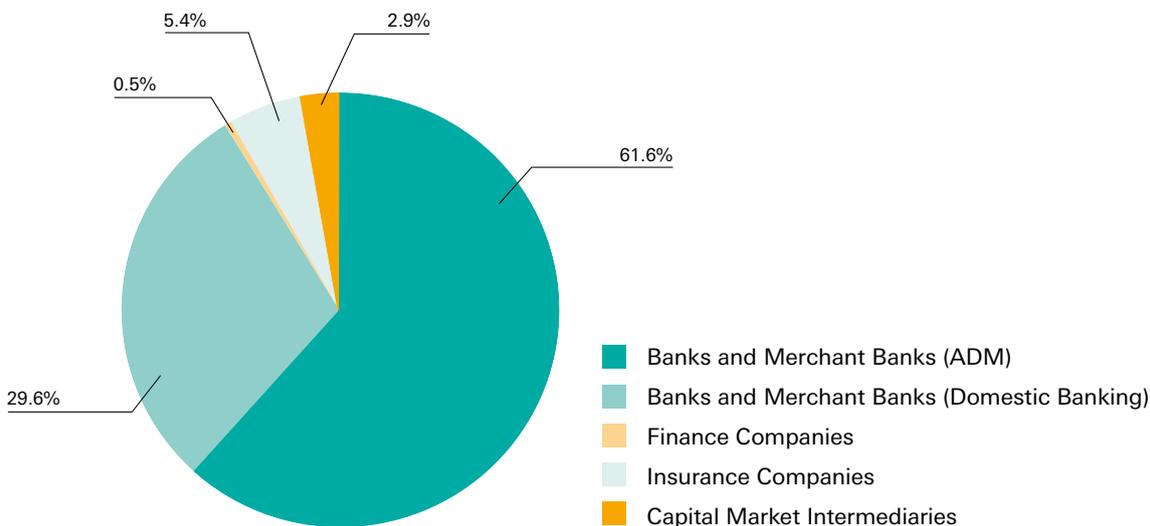


Figure 2-1: Assets Distribution of Financial Institutions 2004

Source: MAS Annual Report, 2004-2005

Singapore is today recognised as a key foreign exchange centre and an important place for wealth and fund management:

- Singapore has been consistently ranked as the fourth¹ most active foreign exchange trading centre in the world, after London, New York and Tokyo. In 2004, the average daily forex turnover in Singapore reached US\$153 billion, a 51 per cent increase over 2001.
- Singapore is today home to more than 30 of the top 50 US and European fund houses. Funds managed in Singapore totalled S\$572.6 billion as at end 2004. Fund management companies in Singapore have expanded in terms of size, regional responsibilities and capabilities.

¹ The three surveys are: “Central Bank Survey of Foreign Exchange and Derivative Market Activity 1998”, Bank for International Settlements, 1999; “Triennial Central Bank Survey of Foreign Exchange and Derivatives Market Activity 2001”, Bank for International Settlements, March 2002; “Triennial Central Bank Survey of Foreign Exchange and Derivatives Market Activity 2005”, Bank for International Settlements, March 2006. The full publication is available for free at the following website: <http://www.bis.org>

Infocomm Spending of Financial Services Industry

As the industry expands, the infocomm spending by the industry remains strong. According to the Singapore IT Spending and Industry Segmentation Report 2005 by IDC, the total estimated infocomm spending² in Singapore for banking, financial markets and insurance sector for year 2004 was US\$1.04 billion. This accounts for 28 per cent of Singapore's total IT spending by user sector.

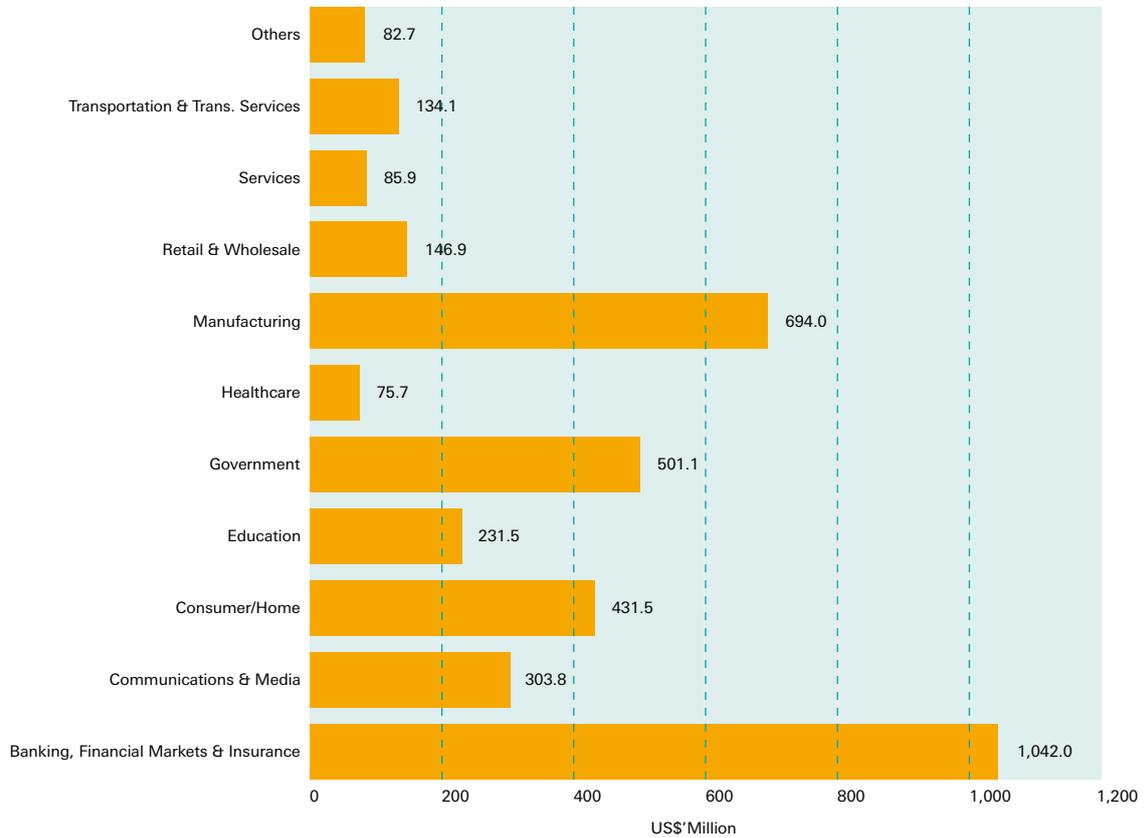


Figure 2-2: IT Spending by Sector in 2004

Information Source: "Singapore IT spending and Industry Segmentation", IDC, June 2005

² "Market Analysis, Singapore IT spending and Industry Segmentation", June 2005, IDC

CHAPTER 3
TRENDS AND
IMPLICATIONS FOR
THE SECTOR

Increased Offshoring

Prior to the digital age, services had to be consumed at the same time and location where they were provided. Today, advances in infocomm have enabled the digitisation of information-rich services as well as the geographical reconstruction of the financial services value chain, thereby allowing processes to be disaggregated and shared across different locations.

Financial services businesses throughout the world are now offshoring activities to consolidate business functions, save costs and improve productivity. This trend will continue. Indeed, Deloitte Consulting predicts that the world's top 100 banks will transfer

about US\$351 billion of their operations and two million jobs offshore over the next five years.

As the pace of offshoring accelerates, more financial institutions are broadening the functions and processes that they offshore to include "higher-end" activities. A survey conducted by The Economist Intelligence Unit and PriceWaterhouseCoopers (EIU-PwC) in 2005, showed that more than 20 per cent of respondents thought that a proportion of knowledge-based tasks such as financial research and modelling would likely be offshored over the next three years.

This presents an excellent opportunity for Singapore to capture a share of the higher-end offshoring market.

Rank	Country	Financial structure	People and Skills availability	Business environment	Total score
1	India	3.47	2.14	1.26	6.87
2	China	3.21	1.76	1.17	6.14
3	Malaysia	2.95	1.12	2.00	6.07
4	Philippines	3.58	1.16	1.05	5.78
5	Singapore	1.62	1.44	2.67	5.73
6	Thailand	3.27	0.94	1.51	5.72
7	Czech Republic	2.57	1.12	1.90	5.58
8	Chile	2.73	0.97	1.87	5.58
9	Canada	1.10	2.03	2.40	5.52
10	Brazil	2.91	1.36	1.23	5.50
11	United States	0.54	2.74	2.22	5.49
12	Egypt	3.55	0.95	0.98	5.47
13	Indonesia	3.51	1.06	0.89	5.47
14	Jordan	3.02	0.91	1.43	5.35
15	Bulgaria	3.29	0.86	1.11	5.27
16	Slovakia	2.72	0.96	1.55	5.24
17	Mexico	2.87	1.16	1.19	5.22
18	Poland	2.67	1.06	1.44	5.16
19	Hungary	2.61	0.88	1.63	5.13
20	United Arab Emirates	2.66	0.61	1.85	5.12

Figure 3-1: A.T. Kearney Global Service Location Index 2005
Source: A.T. Kearney, 2005

Today Singapore is already one of the preferred locations for international financial institutions to centralise financial activities. Despite our relative cost disadvantage compared with other emerging countries, Singapore is favourably ranked fifth in terms of location for offshoring by AT Kearney in 2005 (see Figure 3-1). In fact, the same survey ranked Singapore as number one location when the weight distribution is changed to minimise risks (see figure 3-2).

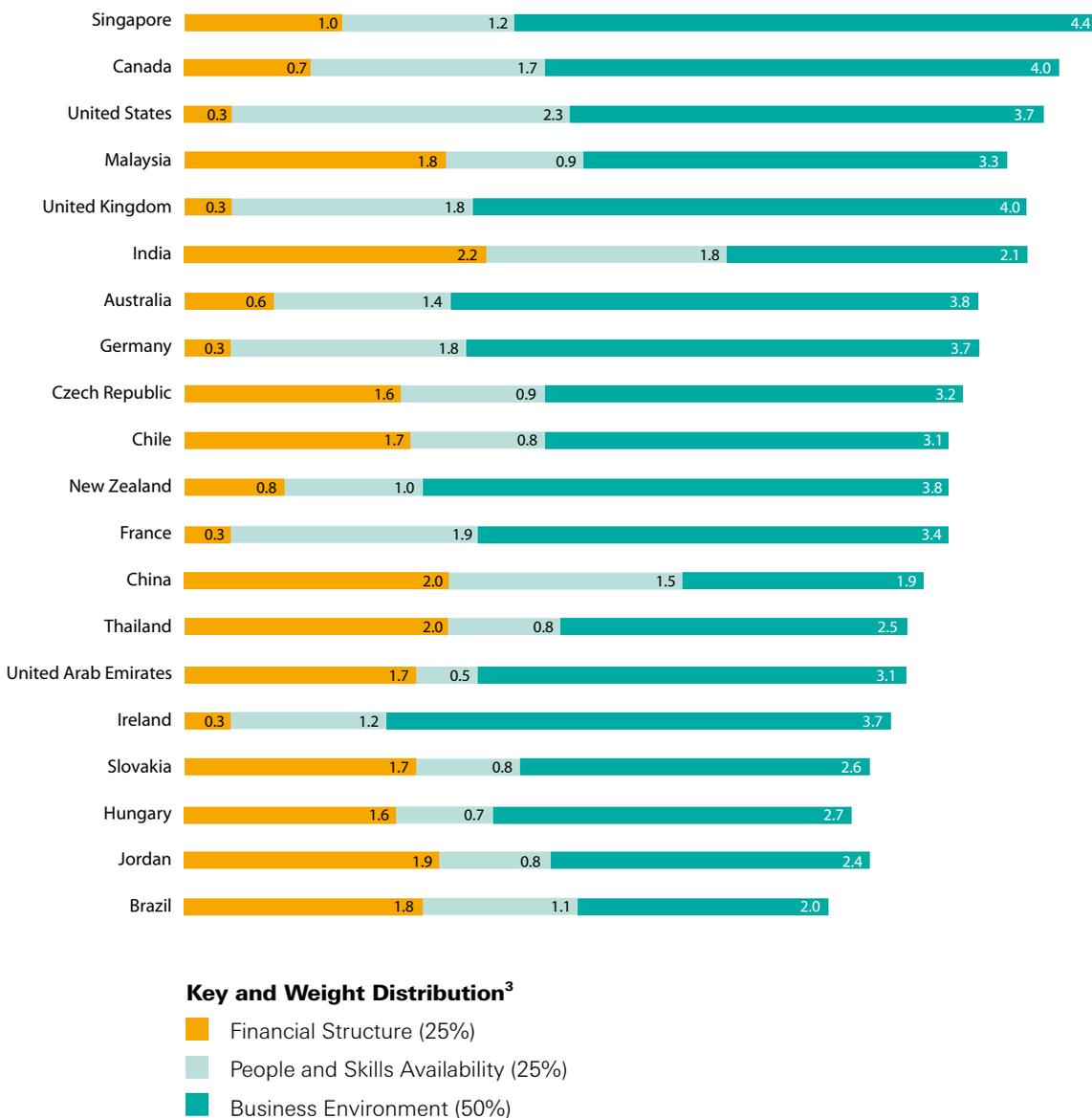


Figure 3-2: When changing the weight to minimise risk, Singapore is the number one location
 Source: A.T. Kearney, 2005

³ Financial Structure refers to compensation costs, infrastructure costs, tax and regulatory costs; People and Skills availability refers to cumulative business process experience and skills, labour force availability, education and language and attrition rates; Business environment refers to country environment, country infrastructure, cultural adaptability and security of intellectual property.

Moving forward, whilst Singapore cannot compete on costs with countries such as China and India, we have differentiated strengths as a trusted business hub with a pro-business environment, high quality workforce and excellent international connectivity. Compared with the key industrialised nations, we are still the most cost-competitive business location (see Figure 3-3) according to a study on 128 cities in nine countries, conducted by accountancy firm KPMG in 2006.

Country	Cost Index	Rank
Singapore	77.7	1
Canada	94.5	2
France	95.6	3
Netherlands	95.7	4
Italy	97.8	5
United Kingdom	98.1	6
United States	100.0	7
Japan	106.9	8
Germany	107.4	9

Figure 3-3: Ranking of cost competitiveness among key industrialised nations

Source: "Competitive Alternatives 2006", KPMG, 2006

There is therefore a good chance for Singapore to become a key offshore centre in Asia for financial services. However, to successfully capture a share of higher-end financial services activities, concerns over governance issues must be mitigated. Regulatory bodies are vigilant in ensuring that standards of compliance and governance are properly maintained. There will also be an increasing need for stronger confidentiality and data protection in the offshored locations. This is where Singapore could further exploit infocomm to strengthen our trust infrastructure.

Wealth Management Opportunities in New Asia

Asia is fast emerging as a region of opportunities for investors. With its huge market and increasing wealth accumulation from a growing middle-class and High Net Worth Individuals⁴, Asia represents huge business opportunities for the financial services industry. According to the Cap-Gemini-Merrill Lynch World Wealth Report 2005, the annual growth rate of High Net Worth Individuals for 2004 – 2009 in Asia Pacific is projected at 6.9 per cent, above the global average of 6.5 per cent (see Figure 3-4).

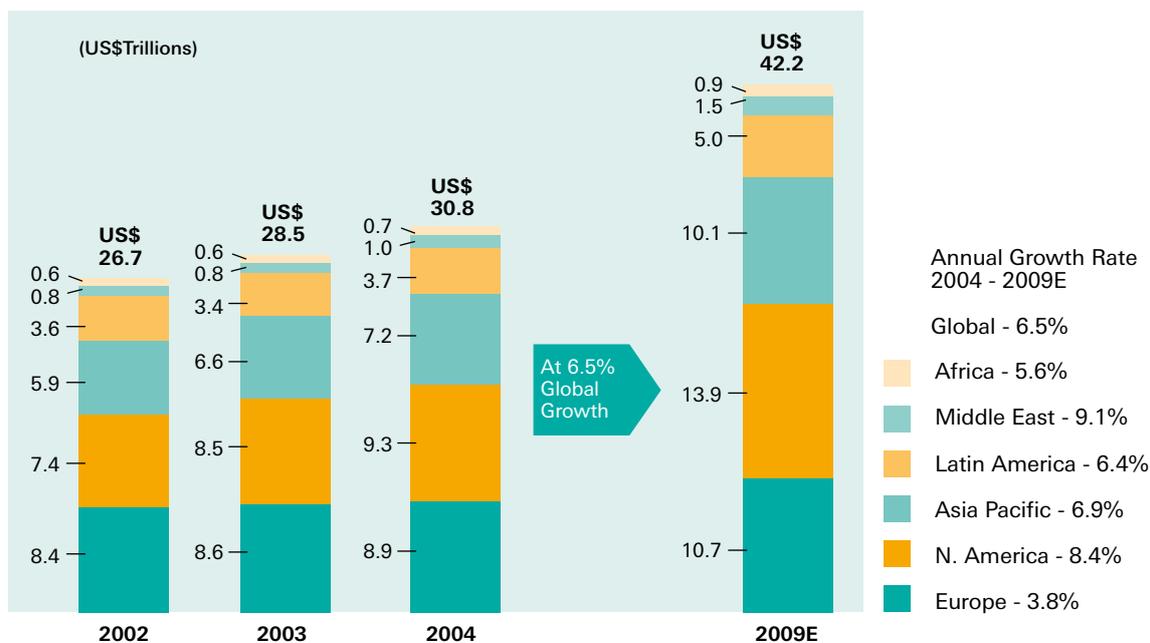


Figure 3-4: HNWI Financial Wealth Forecast by Region
 Source: "World Wealth Report 2005", Cap-Gemini Merrill Lynch, 2005

At the same time, studies⁵ have shown that the needs and attitudes of these wealth management clients have changed over the years. Clients are now more conscious of getting value for their money, demanding greater price visibility and additional value-added services. The Cap-Gemini-Merrill Lynch World Wealth Report 2005 also noted that the lucrative mid-tier wealth management market⁶ has complex needs which require, paradoxically, a simplified service model from financial institutions to deliver consolidated reporting, a broad multi-generational view of wealth management, unbiased advice and co-ordinated delivery from multiple providers.

4 Individuals who hold at least US\$1 million in financial assets. According to the 2005 Cap-Gemini-Merrill Lynch World Wealth Report 2005, the number of High Net Worth Individuals in Asia Pacific grew by 8.2 per cent between 2003 and 2004.
 5 "Searching for Profitable Growth: Global Wealth 2005", Boston Consulting Group, 2005
 6 Individuals with between US\$5 million and US\$30 million in financial wealth

These trends will have implications for Singapore.

First, the growing affluence in Asia provides a ready investor class for the wealth management industry. Singapore, ranked sixth in the world and first in Asia⁵ as an offshore private banking centre, is well placed to capture a share of the lucrative wealth management market. As wealth management is an area that emphasises discretion, “low-key” approaches and the need for a trusted safe haven environment that offers stability, Singapore could leverage on infocomm to reinforce its trusted hub reputation. Not only can Singapore be the secured location to offer both middle and back office services to customers in Asia, wealth managers can also tap on our advanced infrastructure and excellent connectivity to conduct regular reviews and deliver advisory services to their customers here as well as in the region.

Second, infocomm can enable online collaboration, data aggregation and more efficient workflow not only for a comprehensive view of portfolio performance, but also a more co-ordinated execution, disciplined risk management and effective customer relationship management. Hence, in seeking to be the next wealth management centre, Singapore should leverage infocomm as a strategic tool to meet the complex needs of the market.

Integration of Capital Markets

Financial exchanges are going through an unprecedented time of competition and rapid market evolution. The increasing demand for cross-border investments and the pursuit of greater liquidity, coupled with advances in infocomm technologies, have led to the consolidation of several financial markets in the US and Europe.

Asia, which has largely been insulated from this development, is however starting to exhibit signs

of closer collaboration. At the inter-government level, within ASEAN, there is commitment to developing an inter-linked ASEAN securities market by 2010. Stock exchanges in the region are independently exploring stronger bilateral tie-ups. For example, The Singapore Exchange (SGX) and the Stock Exchange of Thailand (SET) signed a memorandum of understanding in Bangkok in November 2005 to explore a two-way derivatives link.

The continued growth of Asia will require deeper and more liquid capital markets. This is where the challenges are the greatest and where Singapore’s small domestic market requires it to look outward. On this front, ASEAN countries are working on harmonising rules, improving market access and establishing common treatment, such as, in terms of taxation and legal policies.

Where capital market integration is concerned, infocomm will be an enabler for integration and consolidation to establish stronger linkages with regional markets. One pre-requisite in the integration of capital markets will be the standardisation of IT platforms and interfaces. A proprietary exchange will be a roadblock to achieving connectivity and end-to-end trade efficiency.

Increased Complexity of Financial Services

The accelerating pace of globalisation and consolidation, together with increasing sophistication among institutions and consumers, has led to greater complexity in financial products and services. In today’s world, even a small financial institution could manage diverse customer groups, products, services and channels across different geographical locations. According to the Operations Council of the Corporate Executive Board, the different permutations of products, distribution channels and locations have increased by a factor of 3600 over the last two decades.

Some of the key drivers for the increased complexity of data include⁷:

- **New instruments.** In the quest to offer compelling products to new customers, new instruments will be created, each requiring timely and accurate information and data management.
- **Changes in market mechanisms.** Decimalisation of the market and programme trading will continue to cause a reduction in trade size with a corresponding increase in volumes. This will put a strain on data management platforms to be able to deliver high volumes of data with low latency.
- **Mergers and Acquisitions.** As companies continue to grow through mergers and acquisitions, their data complexity multiplies.
- **Regulation and compliance.** The increased intensity of regulatory oversight, e.g. Basel II and Sarbanes-Oxley, will require companies to put in place better data management solutions to produce more accurate and timely data for compliance.

It is also estimated that about 30 – 40 per cent⁸ of processing costs could be eliminated through more co-ordinated information management and standardised interfacing of diverse workflows. In a recent Economist Intelligence Unit Foresight 2020 report, financial institutions also identified the ability to integrate data and automate processes to be critical to future productivity gains (see Figure 3-5).

Infocomm will be a strategic tool to help manage complexity. First, only through adoption of common data and messaging standards can compatibility of financial and operational systems be assured, and processes optimised. Second, advanced computing speeds and tools can enable more intelligent data-mining to help the financial institutions manage risks real-time and allocate capital for better risk-adjusted returns.



Figure 3-5: Technology-enabled change – including data integration and process automation – will be critical to future productivity gains.

Source: “Foresight 2020”, The Economist Intelligence Unit, 2006

7 “Transforming data management in the financial markets industry”, IBM Consulting Services, 2003

8 “Operations Council Report”, Corporate Executive Board, 2005

Technology and Finance

The advent of the Internet had already enabled the financial services industry to reach out to new markets and extend their distribution of products and services. As technology advances, it will change the way the industry interact with their customers and counterparts, or even disrupt and radically transform the structure of the industry.

The technology landscape in Singapore in 2015 will be different from today. In particular, both infrastructure and computing capabilities of tomorrow will offer new possibilities to the industry. For instance:

- Infrastructure – Singapore would have already developed a next-generation national infocomm infrastructure. This new infrastructure will be accessible everywhere on the island, providing individuals with gigabits per second speed and seamless access. Customers will be able to do their banking wherever they are. Competitive advantages could belong to banks which could deliver media rich information and services anywhere anytime.
- Computing and Software – Not only will computing power be higher, it will also be cheaper. At the same time, there will also be more intelligent software to manage and analyse data. Financial services industry can now compute financial positions and track risk exposure accurately in real time to better allocate capital to maximise returns.
- Knowledge management and customer support technologies can help companies extract value from seemingly uncorrelated data to maximise return on capital, as well as to anticipate and react to customer demand with greater precision. This will create new competitive advantage for our financial services industry.

In such an environment, leadership will be claimed by those adept at harnessing product, service and process innovation to anticipate customers' needs. Specific areas of innovation that have potential to fuel enormous growth may include retail payments, mortgage loans, account and product integration, global expansion and customer experience⁹.

Evolution of Payment Solutions

A significant trend in consumer retail payment services has been the relative shift away from cash towards electronic payment methods. This increasing demand for online and real-time payments has spurred the development of new and innovative products for electronic payments.

Innovation in payment systems has the potential of:

- Stimulating consumption and GDP growth by as much as half a per cent for every ten per cent increase in the share of electronic payments in the economy¹⁰.
- Lowering transaction costs by reducing the costs of handling cash and reconciling payments.
- Increasing efficiency by eliminating paper and streamlining processes – generating process savings of up to 76 per cent¹⁰.
- Boosting financial intermediation, and thereby liquidity and lending in the banking sector.
- Increasing convenience to users by opening up new channels for payment.



⁹ "The Paradox of Banking 2015: Achieving more by doing less", IBM Institute, 2005

¹⁰ "Payment Solutions for Modernising Economies, VISA", Sep 2004

The payment landscape will continue to be challenged by the emergence of new technologies and business models. But this presents opportunities for new payment solutions to enable transactions in new markets. In particular, advances in handset, chip and mobile network technologies, together with upgrades to the point of sale infrastructure, will change the landscape for electronic micro-payment solutions.

These developments point to new opportunities for Singapore. So far, Singapore has been successful in adopting advanced payment solutions. Our payment system has evolved from one that was based essentially on paper and cash, to one presently that comprises a diverse range of cashless payment instruments with efficient and reliable clearing and settlement. Today, Singapore is already recognised as an advance adopter of e-payment solutions. In the area of online commerce, Singapore was ranked on par (with a score of 8.0 out of 10.0) with countries like Korea, ahead of Japan, by the 2005 Economist Intelligence Unit e-readiness report. A recent report by Arthur D. Little also placed Singapore amongst one of the advanced users of mobile payments, alongside Korea, Japan and Austria.

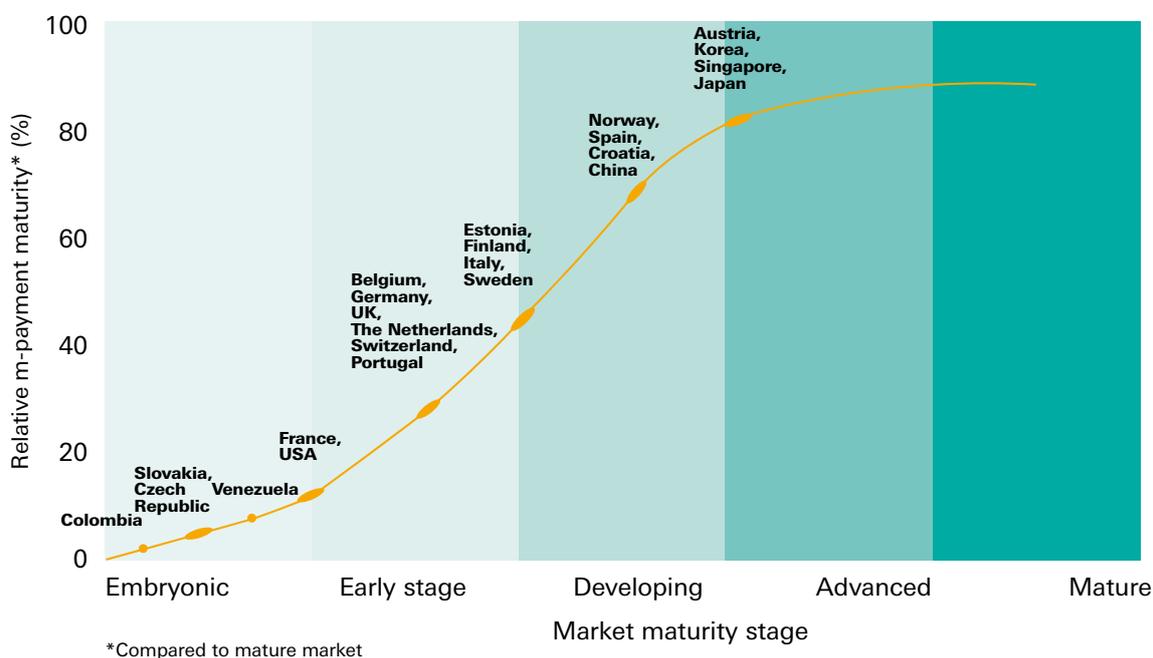


Figure 3-6: M-commerce/M-payment ranking¹¹
 Source: Global M-Payments Update 2005 Report, Arthur D. Little, 2005

For Singapore, the challenge is to continue to invest in payments innovation while at the same time, ensuring more cooperation among the various payment platforms in order to have less market fragmentation and more open solutions that can be used on a wider scale. This will help boost market growth and create potential for exportable payment services to the region.

11 "Global M-Payments Update 2005 Report", Arthur D. Little, 2005

CHAPTER 4
iN2015 GOAL FOR
FINANCIAL SERVICES

The iN2015 Financial Services Sub-Committee proposed this goal for Singapore:

A trusted gateway to emerging Asia, an innovative hub for financial services, powered by infocomm.

As a trusted gateway to emerging Asia, Singapore aspires to capitalise on its position as a financial hub with a sound regulatory regime and excellent infrastructure, not just to serve the domestic economy, but also the growing Asian region. As a trusted gateway, Singapore will be entrusted to process key high value-added financial services and provide access to the main financial markets in Asia.

As an innovative hub, Singapore, with its advanced infocomm infrastructure, high quality workforce and IT-savvy finance sector, will be the ideal location for companies to use infocomm to develop and deploy innovative financial services. Singapore will also be the location of choice for financial services institutions to test out emerging technologies such as grid technologies, service oriented architectures, virtualisation of data and storage, and predictive intelligence for customer analytics.

Leveraging on infocomm to innovate will have a multiplier effect to reach out to regional markets. Indeed, the ability to innovate and create new products, processes or services that anticipate and meet customers' increasing demands is key to being a sustainable premier financial services centre.



CHAPTER 5
RECOMMENDED
STRATEGIES AND
PROGRAMMES FOR
FINANCIAL SERVICES

iN2015 Financial Services Goal:

A trusted gateway to emerging Asia, an innovative hub for financial services, powered by infocomm

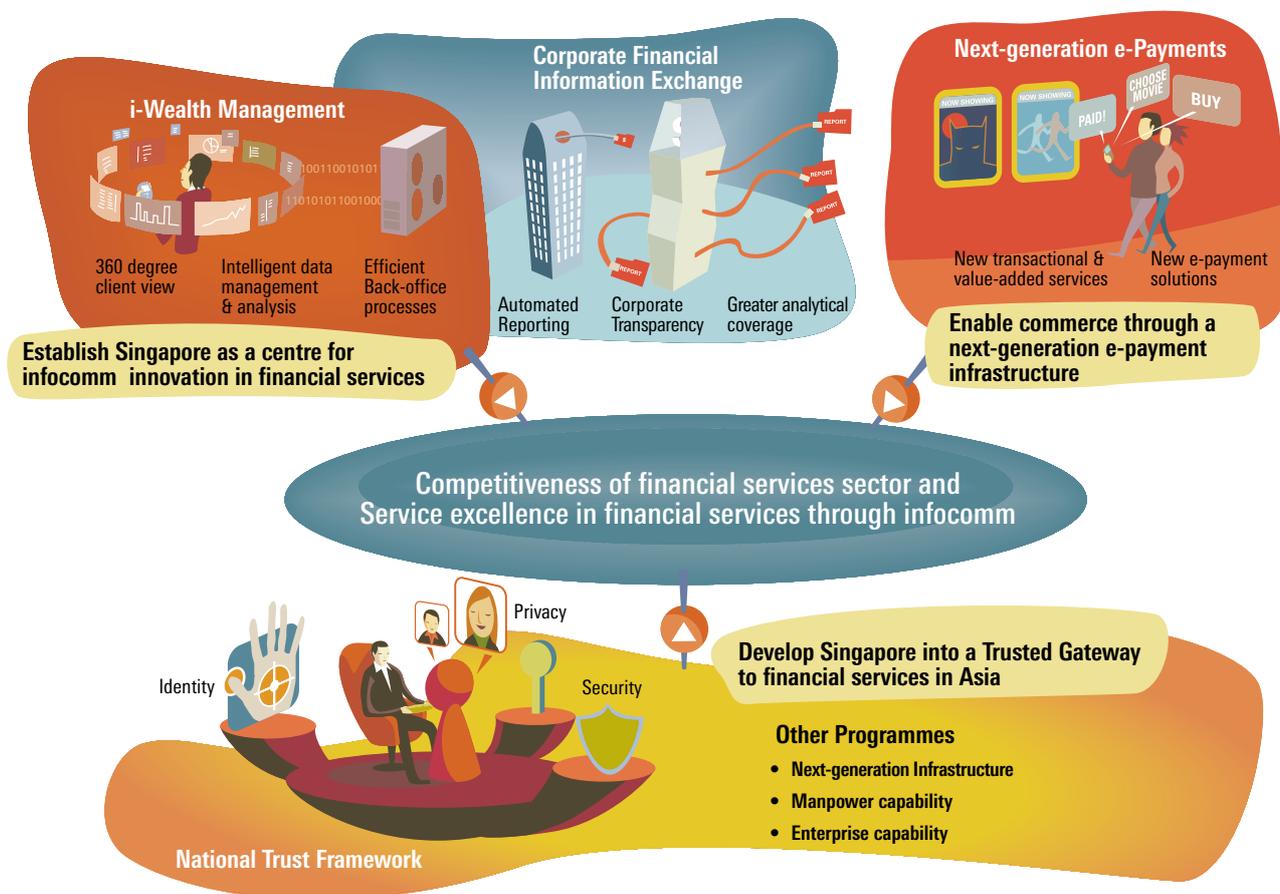


Figure 5-1: Strategies proposed by the iN2015 Financial Services Sub-Committee

To achieve the iN2015 Financial Services goals and outcomes, the following strategic thrusts were formulated:

- **Strategic Thrust 1:**
Develop Singapore into a trusted gateway to financial services in Asia
- **Strategic Thrust 2:**
Establish Singapore as a centre for infocomm innovation in financial services
- **Strategic Thrust 3:**
Enable commerce through a Next-generation e-Payment infrastructure

The first strategic thrust is a broad based approach to sharpen our factor inputs and harness infocomm as a strategic enabler to help strengthen Singapore’s attractiveness as both a choice location for financial services and an access point to other markets.

The second seeks to develop new capabilities and niche competencies, with innovation as its focus, to power the growth of the financial services industry.

The third puts in place the infrastructural components needed to provide convenient electronic payment solutions over different channels for users and businesses. This will catalyse transactions across all sectors of the economy and enable the creation of potentially new market spaces that were previously unserved or unprofitable.

Goal	A trusted gateway to emerging Asia, an innovative hub for financial services, powered by infocomm		
Outcomes	Competitiveness of financial services sector through infocomm	Service excellence in financial services through infocomm	
Strategic Thrusts	Develop Singapore into a Trusted Gateway to financial services in Asia	Establish Singapore as a centre for infocomm innovation for financial services	Enable commerce through a next-generation e-payment infrastructure
Strategies	<ul style="list-style-type: none"> • Entrench Singapore's reputation as a reliable and trusted business location • Ensure quality and cost-competitive telecommunications infrastructure and connectivity • Build high quality workforce with cross-disciplinary skills in infocomm and finance • Attract and anchor high-end financial services in Singapore • Create regional marketplaces for (new) financial products 	<ul style="list-style-type: none"> • Drive innovation agenda across the financial services industry through concerted deployment of iconic projects • Develop capabilities within the infocomm industry to support innovation within financial services industry 	<ul style="list-style-type: none"> • Drive concerted deployment of innovative payment solutions • Drive creation of value-added services

Strategic Thrust 1:

Develop Singapore into a Trusted Gateway to Financial Services in Asia

Strategy 1.1: Entrench Singapore's Reputation as a Reliable and Trusted Business Location

With the rising number of cyber-threats and increasing pressures for regulatory compliance, the importance of trust as a competitive factor to a financial services hub cannot be understated. Today Singapore is already well regarded as a trusted business hub. It was given top rankings for its judicial system, intellectual property rights protection and corporate governance by PERC in 2005. Singapore has excellent AAA and Aaa credit ratings from Standards and Poor, and Moody respectively.

Recognising trust as a highly important competitive factor that cannot be easily replicated, the Sub-Committee recommends that Singapore further entrench its reputation as a reliable and trusted business location.

There are three key inhibitors of trust that need to be addressed in maximising Singapore's potential as a gateway to financial services in Asia:

- Security – Cyber-attacks compromise the security, reliability and integrity of systems, and data
- Privacy – Infringements of data privacy undermines consumer confidence and trust in financial services
- Identity – Identity theft leads to unauthorised access to online assets and resources, resulting in fraud

Singapore will further exploit infocomm technologies and put in place a comprehensive National Trust Framework, which includes both hard infrastructures as well as pro-business policies, to ensure the resiliency of its financial infocomm infrastructure.

Strategy 1.2: Ensure Quality and Cost-competitive Telecommunications Infrastructure and Connectivity

The Sub-Committee also recommends that Singapore should continue to ensure a world-class yet cost-competitive telecommunications infrastructure. Lower connectivity costs to the region will also boost the country's attractiveness as a higher end hub for shared services.

To this end, a Next-Generation Infocomm Infrastructure which comprises an ultra high-speed National Broadband Network (NBN) to support new high-bandwidth applications and services will be implemented. Singapore will also implement a pervasive Wireless Broadband Network (WBN) to support new mobile and location-aware services. Singapore should also continue to build international connectivity to the region.

Strategy 1.3: Build High Quality Workforce with Cross-disciplinary Skills in Infocomm and Finance

The availability of quality manpower is one of the most important pre-requisites to being a high-end financial services centre. Singapore must ensure that its workforce continuously acquires capabilities to stay at the forefront of developments.

The Sub-Committee recommends that the Government work closely with the industry to develop a new breed of globally-competitive infocomm workforce – techno-strategists with both technical depth and finance business domain capabilities. These techno-strategists will help define complex problems in financial services and translate them into implementable IT solutions or products that people, companies and governments need and want.

The Government should:

- Engage industry and other relevant agencies to jointly map out the inter-disciplinary competencies for infocomm and finance. This roadmap is to better match the training programmes to the industry's needs and to serve as a foundation for development of techno-strategists.
- Develop internships and infocomm scholarships with the industry.
- Support infocomm training and skills upgrading of both financial service professionals.
- Put in place programmes to support the sourcing of international talents.





Strategy 1.4: Attract and Anchor High-end Financial Services in Singapore

The Sub-Committee recommends that the Government continue to play a catalytic role in attracting foreign financial institutions and anchoring high end financial services activities into Singapore.

The competition to attract such services is intense as many lower cost offshore centres are also moving towards more complex projects that yield higher margins. So, Singapore should focus on areas that play to its strengths, like wealth management and risk management.

In particular, Singapore should also further invest in building its Business Continuity and Disaster Recovery (BC/DR) capabilities. It is the first country in the world to have introduced a Standard and Certification programme for BC/DR service providers.

To advance further, Singapore should set pace in providing high-quality performance assurance. It should lead in creating international standards and benchmark practices in BC/DR and other offshoring work practices. However, given the island’s geographical limitations, the Sub-Committee suggests that the Government also put in place plans to mitigate the concentration risks.

As part of the strategy to attract and anchor BC/DR activities, the Government should promote strategic partnerships between infocomm local enterprises and offshore players to provide adaptive capabilities to innovate and meet the demands of customers that the offshore centre serves.

Strategy 1.5: Create Regional Marketplaces for (New) Financial Products

A critical success factor to becoming a key financial services centre is to have both liquidity and depth in financial markets. As the pace of consolidation of financial markets gathers in Asia, Singapore should aim to establish itself as a key gateway to Asian markets to better serve global investors. The Sub-Committee agrees that the most liquid and well regulated exchange will win the lion's share of order flow. Leadership is expected to come from exchanges that position themselves as conduits linking issuers and market makers for a broader range of trading and information services.

The Sub-Committee recommends that Singapore continue to forge regional linkages with other exchanges and work towards integration of regional marketplace. In the case of financial products, such as Asian bonds that are currently not traded on an exchange as well as other new derivative products, the Sub-Committee also recommends that Singapore play a stronger role in allowing new electronic regional marketplaces to flourish. To this end, it is vital that the playing field be levelled for more private sector participation and that regulatory barriers be overcome to achieve common rules, access and treatment.

Where infocomm will play a stronger role is in the harmonisation of technology standards to reduce the fragmentation of systems and platforms. Exchanges must keep pace with product innovations and technology standards in financial markets and offer widespread connectivity to attract a diverse global customer base. Singapore should take a lead in embracing technology standards and promoting collaboration across exchanges through the adoption of common standards.

Key Programme Supporting Strategic Thrust 1

National Trust Framework

The National Trust Framework (NTF) aims to entrench Singapore's reputation as a trusted business hub.

- **Trusted Infrastructure Development**

The objective is to develop the "hard" and "soft" infrastructure to help secure, protect and manage users' assets, activities and identities online. This will be done through implementation of:

- **National Authentication Framework** to catalyse e-business through the pervasive deployment of strong authentication infrastructures across key sectors.
- **National Privacy Infrastructure** to support innovation of personalised e-services and biomedical research through the lawful and ethical usage of personal data.
- **Infocomm Security Health Scorecard** to mitigate disruptions caused by cyberattacks to business operations through a set of minimal infocomm security standards that benchmark the integrity of all infocomm systems.
- **Information Systems Assurance Initiative** to facilitate purchasing decisions by governments and businesses through international assurance certifications for infocomm security solutions such as Common Criteria and Business Continuity/Disaster Recovery. This builds on existing work under the Infocomm Security Masterplan on the Common Criteria and other related security standards.
- **National Cyberthreat Monitoring Centre** will build on the current efforts undertaken by the Cyber-Watch Centre to provide the nation with the capability to respond to infocomm security events.

- **Manpower Development**

The objective is to build a critical pool of competent infocomm security professionals to secure information assets against cyber threats. This will reinforce Singapore's reputation as a choice-location for hubbing high-end infocomm-enabled services like security and risk management functions.

- **Education and Adoption**

The objective is to equip end-users with the knowledge and tools to protect their computers from cyber threats and privacy infringements. This will help encourage the adoption of online activities and new channels for the distribution of financial services.

- **Regulation**

The objective is to address the need to safeguard and manage users' digital assets and identities activities through regulatory measures.

Strategic Thrust 2:

Establish Singapore as a Centre for Infocomm Innovation in Financial Services

Strategy 2.1: Drive Innovation Agenda across the Financial Services Industry through Concerted Deployment of Iconic Projects

Today, financial service activities are characterised by speed and continuous innovation. The ability to innovate and create new products, processes and services that meet customers' increasing demands has become the key to being a sustainable premier financial services centre.

The recommendation is about raising the innovation capacity of the country's financial services industry through infocomm and to position Singapore as a leader in this respect.

Singapore has strong capabilities in infocomm deployment and R&D, a world class infocomm infrastructure, and sophisticated infocomm users. These attributes make Singapore an excellent testbed for infocomm innovation in financial services.

The Government should identify and drive the deployment of flagship infocomm projects that can deliver significant sector-wide benefits. These projects will help rally technology resources from solution providers and research institutes to develop and test new products and ideas in financial services, which can eventually be exported and add to the revenues generated by the infocomm industry.

To capture a share of the growing wealth management market, Singapore should drive infocomm innovation to build new capabilities to meet the complex needs of the wealth management customers. This will require leveraging infocomm to enable online collaboration, data aggregation and efficient workflow, at both front-end customer engagement and investment management and back office processing, in order to have a more co-ordinated execution, disciplined risk management approach and simplified customer relationship management.

Strategy 2.2: Develop Capabilities within the Infocomm Industry to Support Innovation within Financial Services Industry

Having a strong infocomm industry is critical to supporting the build up of progressive capability and enabling innovation in financial products, processes and services.

The Sub-Committee recommends that the IDA support the development of a strong infocomm industry to help financial services institutions leverage on emerging technologies to produce leading-edge exportable solutions for financial services industry.

As competitive forces intensify within the financial services industry, the ability to partner best-in-class specialists and solution providers is vital to the growth of a financial institution. The Government should also foster stronger collaboration amongst financial service providers, research institutes and infocomm solution providers to jointly develop leading capabilities in the effective application of infocomm technologies to financial service processes.

Key Programmes Supporting Strategic Thrust 2

I-Wealth Management

The programme looks to infocomm to help capture the growing wealth management market and strengthen Singapore's position as the premier wealth management centre.

Infocomm can extend the industry's capabilities in the following areas:

- **Client Service and Advisory**

The aim is to extend wealth management services and tools to the mass affluent and even the retail customers where possible, so as to empower them to better manage their wealth.

To this end, infocomm can be leveraged to provide users

- a 360 degree view of personalised information across different asset classes;
- multi-channel access to personalised information.

Technological advances do not mean the end of traditional face-to-face delivery of services. Instead it will enhance the capabilities of local wealth managers to add value and interact more frequently with their customers in Asia. The future generation is one that has a high affinity for technology. The opportunity exists for Singapore to position itself as a test-bed for banks to leverage on technology to standardise and aggregate data across providers and to tap on new electronic channels to better serve their customers. Competitive advantage will belong to companies able to provide services anytime anywhere¹².

The key challenges include the industry's lack of standardised data and the customers' concerns over privacy and security, especially the higher net worth individuals.

- **Investment Management and Product Development**

The aim is to leverage on infocomm to enable quicker time to market of innovative financial products and services that meet the increasingly exigent needs of the customers. This ability to innovate is key to Singapore being a wealth management centre in Asia. This is done through leveraging future computing resources such as grid computing for computing-intensive operations, collaborative tools and new data management solutions to allow geographically separate teams to work together, and intelligent data-mining software to develop insights into customers' needs.

- **Back Office Operations**

The aim is to leverage on infocomm to promote greater Straight-Through Processing (STP) to cut costs and achieve greater efficiency. This is done through adoption of common standards and alignment of business practices.

12 "Foresight 2020", The Economist Intelligence Unit, 2006

As part of the programme, the following approach has been put forward:

- Review policies where necessary to facilitate data-sharing and enable straight-through processing;
- Spur infocomm innovations in wealth management, from client service and advisory to investment management and back office financial processing areas through supporting innovative pilots;
- Encourage collaboration of value-chain players to jointly implement iconic projects in key areas of financial services.

Specifically, three projects under consideration include:

- ***Paperless Fund Management***

The aim is to streamline fund management processing in Singapore through promoting the adoption of a common standard for financial messaging. A 2004 consultancy study conducted by Accenture and the local funds management industry indicated that manual data processing increases operational cost by more than S\$10 million. By aligning fund management practices through adoption of ISO-based standards, the industry can save costs, cut down time required for clearing and settlement and enable automated and paperless front-end servicing to the customers.

- ***Paperless Insurance***

This involves supporting business to consumers and business to business integration between consumer, financial advisors, insurers, brokers, re-insurers and other value chain players through adoption of common platform and standards. The project will provide capability in financial advisory, real time underwriting and claims processing.

- ***360° Service Delivery***

This involves supporting innovative use of knowledge management and customer support technologies to provide end-users a holistic view of their assets and personalised information, potentially across multiple channels, to better manage their wealth. The project will also allow banks to have the capability to offer the right product to the right customer at the right time. To this end, the Government should support innovative pilots and ensure that conducive policies are put in place to allow sharing of information while protecting users' needs for privacy.

Corporate Financial Information Exchange

The programme seeks to automate financial reporting and facilitate financial analysis.

Today, increased economic, market and regulatory pressures are requiring companies to publish information to a myriad of internal and external stakeholders in greater frequency and variety of formats. There is currently no common standard for companies when they publish or submit their financial statements online. This makes data retrieval and processing tedious, time consuming, costly and error-prone. This also results in difficulties using and comparing data between companies.

The emergence of technology standards for financial and operational business reporting known as eXtended Business Reporting Language (XBRL) make it possible to store and transfer data along with complex hierarchies, data-processing rules and descriptions that enable analysis and distribution. Through adoption of the standard, the mechanics of working with financial statements could be simplified. This promises to:

- Cut down the costs and time in the assembling, distribution, analysis and assessing of financial reports
- Improve data quality and accuracy of business reporting
- Improve ability to compare information and disclosures, thereby improve corporate governance and transparency

As a result, companies will have greater control of the information they communicate and spend less time preparing data for reporting. Putting in place a common financial reporting standard will also increase information transparency and help regulators lower their burden of monitoring compliance. It also enables analysts and financial information providers to automate analysis and provide greater market coverage, which in turn benefit the investors. In short, the adoption of XBRL promises to help companies make faster and better decisions, lending to more efficient capital markets.

As part of the implementation programme, the following approach has been put forward:

- Co-ordinate efforts in taxonomy development of the standards for electronic reporting of financial information (XBRL) and promote its adoption by businesses
- Rollout regulatory and tax reporting using XBRL
- Engage the industry to provide value-added services on top of the platform for the corporate community and individual investors through supporting innovative pilots
- Align academic institutions to fine-tune curriculum to incorporate the necessary skill development for implementation of financial reporting

Strategic Thrust 3:

Enable Commerce through a Next-generation e-Payment Infrastructure

Strategy 3.1: Drive Concerted Deployment of Innovative Payment Solutions

Here, the vision is to deploy new electronic payment solutions over different channels. Given the relatively mature payment market and sophisticated pool of users, the Sub-Committee suggested that Singapore positions itself as the testbed for innovative payment solutions. This means creating an environment to encourage both innovations of payment solutions as well as deployment of nation-wide new electronic payment solutions to catalyse transactions across all sectors of the economy.

To be successful, the Sub-Committee recommends that the industry:

- Work closely to concertedly drive the deployment of innovative payment solutions. Singapore's market is too small for fragmentation. The success of new mobile payment solutions in other countries has also demonstrated the need to have the right combination of players on board, the right partnership business model, and easy-to-use payment solutions for the end-consumers. A concerted deployment will also provide a seamless and common user experience to drive adoption.
- Promote adoption of open standards. Many implementations of payment solutions in Asia had mostly been based on proprietary standards. This limits the potential for export and the growth of cross border transactions. There is an opportunity for Singapore to gain a leadership position by implementing world-class electronic payment solutions based on international standards. Financial institutions and infocomm solution providers can then export these leading edge solutions that are based on open standards to other countries.

Strategy 3.2: Drive Creation of Value-added Services

Once the channels for new electronic and mobile payments are developed, the deployment of value-added services should be encouraged to spur online transactions and bring greater convenience to end-users. For example, both pre and post payment applications, such as online bill presentment that allows users to consolidate their bills and payments into an online budget dashboard should be encouraged. Singapore should foster a conducive environment to encourage the creation of such services.

Key Programme Supporting Strategic Thrust 3

Next-generation Electronic Payments

The programme aims to support the development of a nation-wide multi-channel electronic payment infrastructure.

Payment is a complex process which involves different parties, different payment modes and different channels (see Figure 5-2). Payment innovations can happen along any part of the value chain.

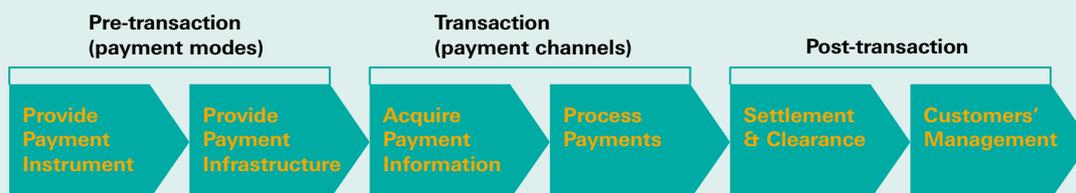


Figure 5-2: Payment value chain

Through the implementation of the programme, there will be new payment solutions deployed to provide more convenience to the users and open up new market spaces such as the mobile digital content market for more retailers and content providers to tap on. However, this should be done while minimising fragmentation along the value chain to allow inter-operability of solutions.

Some challenges identified include:

- **Proximity Payments Solutions**

The challenge is to work with the operators to ensure inter-operability of existing proximity payment solutions and to allow new contactless payment solutions in future to have a chance to penetrate the market.

- **Online Payments**

The implementation of a National Authentication Framework could help prevent fragmentation of the market. There is also potential for development of new online peer-to-peer payment solutions.

- **Mobile Payments**

The challenge is to find the right business and partnership model for the telecom operators, applications providers and payment service providers to jointly deploy inter-operable payment platform and to allow easy deployment of new value-added services that leverage on the mobile payment platform.

As part of this programme, the following approach has been put forward:

- **Soft Infrastructure Development**

The objective is to ensure that the right standards and policies are put in place to allow innovation development and future rollout of payment solutions. The Government should promote adoption of payment standards to prevent fragmentation in the market. The Government should also review policies with a view of driving greater adoption of electronic payment solutions while ensuring security of online transactions.

- **Technology Innovation Development**

The objective is to ensure that Singapore stays at the forefront of technology innovation in payments and is ready for future implementation of advanced payment solutions. This involves the development of innovative payment technologies and solutions e.g. biometrics for payments.

- **e-Payment Rollout**

The objective here is to encourage collaboration amongst electronic payment value chain players to implement nation-wide electronic payment solutions. Specifically, the Government should engage the industry to roll out new mobile as well as contactless payment solutions.

CHAPTER 6

CONCLUSION

This report provides a brief analysis of key trends impacting the global financial services landscape and outlines the strategies and near term programmes to leverage on infocomm to increase the competitiveness of the financial services sector.

To achieve the outcomes set in the various programmes, the Sub-Committee recommends that IDA work closely with the Monetary Authority of Singapore (MAS), the lead agency promoting Singapore as an international financial services centre. IDA and MAS should collaboratively engage the private sector and exploit infocomm effectively to strengthen Singapore's position as an international financial services centre.

To succeed in the long term, Singapore will have to remain nimble and be able to anticipate and deal with changes. New programmes will be introduced as the industry evolves and new opportunities arise. The next 10 years will be exciting times for the financial services sector. With stronger public and private collaboration, there will be many new opportunities to leverage on infocomm to transform the sector.

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Infocomm Development Authority of Singapore

IDA is committed to growing Singapore into a dynamic global Infocomm hub. IDA uses an integrated approach to developing info-communications in Singapore. This involves nurturing a competitive telecoms market as well as a conducive business environment with programmes and schemes for both local and international companies.

For more information, visit www.ida.gov.sg

Singapore Computer Society

SCS, established since 1967, is the premier professional body for IT practitioners and IT users in Singapore. With a membership of over 22,000, it is an invaluable network for its members. SCS administers various certification programmes that help individuals gain professional recognition for career development.

For more information, please visit their website at www.scs.org.sg

Singapore infocomm Technology Federation

SiTF is Singapore's national infocomm industry association. It brings together 500 corporate members from MNCs and local companies, who collectively account for over 80% of the industry revenue. The SiTF assists its members in business development, market intelligence, overseas trade missions, networking and alliances.

For more information, please visit their website www.sitf.org.sg

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