



**REWIRING THE ENTERPRISE FOR DIGITAL
INNOVATION: THE CASE OF DBS BANK**

HBP No. NTU071

Publication No. : ABCC-2015-004

Print Copy Version: 2 Jun 2015

Sia Siew Kien, Christina Soh, Peter Weill & Yvonne Chong

This case chronicled the digital transformation of DBS Bank in seeking regional growth amidst a new digital era in the Asian banking industry. Led by its CEO, DBS invested heavily in technology and undertook radical changes to 'rewire' the entire enterprise for digital innovation. Key thrusts of its digital transformation strategy involved the revamp of its Technology and Operations organization, the development of scalable digital platforms, the leverage on technology to redesign the customer experience, and the internal incubation and external partnering in seeking new digital innovation.

However, questions remain whether DBS has done enough to put digital at the heart of banking? What should be the next steps in their digital strategy? Where should the bank direct its technology investment dollars? How can DBS systematically assess the opportunities and threats of digital disruption in the banking industry and devise a set of possible strategic responses? How can DBS stay at the forefront of digital innovation to become the Asian Bank of Choice for the New Asia?

Associate Professor Sia Siew Kien, Professor Christina Soh, Professor Peter Weill and Yvonne Chong prepared this case based on public sources and interviews with key personnel of DBS Bank. As the case is not intended to illustrate either effective or ineffective practices or policies, the information presented reflects the authors' interpretation of events and serves merely to provide opportunities for classroom discussions.

COPYRIGHT © 2015 Nanyang Technological University, Singapore. All rights reserved. No part of this publication may be copied, stored, transmitted, altered, reproduced or distributed in any form or medium whatsoever without the written consent of Nanyang Technological University.

For copies, please write to The Asian Business Case Centre, Nanyang Business School, Nanyang Technological University, Nanyang Avenue, Singapore 639798

Phone: +65-6790-4864/5706, Fax: +65-6791-6207, E-mail: asiacasecentre@ntu.edu.sg

Banks need to shake themselves out of institutional complacency and recognize that merely navigating waves of regulation and waiting for interest rates to rise won't protect them from obsolescence.¹

INTRODUCTION

Since its establishment by the government in 1968, DBS Bank (DBS) had grown from a Singapore bank to become the largest bank by assets in Southeast Asia. In 2014, DBS' network centred on three key Asian axes of growth – Greater China, Southeast Asia and South Asia, with over 280 branches across 18 countries. (See **Exhibit 1** – Geographic and Business Mix.) More than half of the bank's 21,000 employees were based outside of its home market.² Its expansion had continued to impress, with its profits growing consistently, and its net profit in 2014 had doubled from its 2010 full-year earnings. (See **Exhibit 2** – Key Financials).

DBS was recognized as one of the world's strongest³ and well-capitalized banks, with "AA-" and "Aa1" credit ratings that were among the highest in the Asia-Pacific. It had received a range of accolades including being named 'Safest Bank in Asia' for six consecutive years to 2014, the 'Best Bank in Asia Pacific', the most valuable bank brand in ASEAN⁴, and overtaking the iconic Singapore Airlines to become the country's most valuable brand. In 2014, DBS was ranked Asia's third-largest trade finance bank by market share, after global banks HSBC and Citigroup.⁵ DBS was the only Asian bank among the top 10 private banks in Asia, in an industry dominated by global wealth managers including UBS, Citigroup and Credit Suisse.⁶

A strategic enabler for this transformation was the relentless drive by Piyush Gupta, who was appointed

the Chief Executive Officer (CEO) of DBS in 2009, to leverage digital technology not just as an infrastructure platform for growth, but also to accelerate the pace of banking innovation for the increasingly tech-savvy Asian consumers. DBS spent S\$600 million annually on technology inclusive of its investment in Internet and mobile banking platforms. In 2014, the CEO announced an additional S\$200 million investment over the next three years, as DBS would continue to develop its digital capabilities to chart the way forward:

Whether we know it or not, the digital revolution has put banks under siege. With Internet 2.0 and mobility, the game has been re-defined. Banks in Asia are on a burning platform of competition from mobile and Internet companies. If we don't embrace digital – and quickly – there is a real danger that our lunch will be eaten. After all, my firm belief is that in the future, people won't need a bank, they need banking.⁷

BACKGROUND

DBS provided a full range of financial services in Asia with businesses in institutional banking, consumer banking, and wealth management. In Singapore, it had the largest network of over 2,500 touchpoints including branches, ATMs, self-service kiosks and partnerships, which served 4.5 million customers in the city-state.

Piyush Gupta joined DBS in 2009 as the new CEO after 27 years with Citigroup. He saw significant growth opportunities in Asia, at a time of weakening economic growth in the US and Europe. The population of Asian middle class was expected to grow to 1.7 billion by 2020, compared to 550 million in Europe. Similarly, the High-Net-Worth-Individual

- 1 Accenture. The Future of FinTech and Banking. (2015, March). Retrieved May 4, 2015, from <http://www.fintechinnovationlablondon.net/media/730274/Accenture-The-Future-of-Fintech-and-Banking-digitallydisrupted-or-reima-.pdf>
- 2 Mortlock, S. (2015, April 15). Half of DBS jobs now outside Singapore as bank ramps up regional recruitment. *eFinancialCareers*.
- 3 DBS ranked 7th strongest bank globally in 2014 by Bloomberg.
- 4 Association of Southeast Asian Nations (ASEAN) is made up of 10 member countries; Brunei, Cambodia, Indonesia, Laos, Malaysia, Myanmar, the Philippines, Singapore, Thailand, and Vietnam.
- 5 DBS. (2014, March 27). Asia Transaction Banking. Delivering Sustainable Returns. Retrieved May 4, 2015, from https://www.dbs.com/iwov-resources/pdf/investor/other-materials/2014/2014-0327_GTSpresentationupdate.pdf
- 6 Vallikappen, S. (2014, October 21). UBS retains top spot among wealth managers in Asia. *Bloomberg*.
- 7 Gupta, P. (2014). Banking Disrupted. *DBS*. Retrieved June 4, 2015, from <https://www.dbs.com/newsroom/influencer/default.page>

(HNWI) wealth was expected to grow at a compounded annual rate of 9.8% in Asia, compared to 7.1% in Europe and 6.4% in North America.⁸

Piyush repositioned the growth strategy from one that was “lacking in boundaries”⁹, to a new vision for DBS to be the ‘Asian Bank of Choice’. The new strategy was reinforced by five pillars – Asian relationships, Asian insights, Asian innovation, Asian connectivity, and Asian service – to cultivate a competitive edge with deep understanding of Asian cultures, to leverage technology in supporting customers across Asia, and to provide a distinct brand of Asian service characterized by being “Respectful, Easy to deal with, and Dependable”.

However, DBS’ physical banking presence was much smaller than that of its ASEAN counterparts, such as Malaysia’s Maybank and Singapore’s OCBC Bank. (See **Exhibit 3** – Major ASEAN Banks.) Singapore’s United Overseas Bank, for example, had a stronger regional footprint with significant presence in Malaysia and Indonesia. DBS successfully acquired Societe Generale’s Asian private banking business in 2014 for US\$220 million, boosting its assets under management to S\$88 billion from S\$39 billion, although the bank’s attempt to expand regionally had also proved to be frustrating. In 2013, DBS failed to gain regulatory approval for a US\$6.5 billion acquisition of Bank Danamon Indonesia, the nation’s sixth-biggest bank with 3,000 branches; in what would have been Southeast Asia’s largest banking takeover. The realization from these challenges was that DBS needed an alternative way of extending its reach to the region:

After Danamon.. it became quite apparent that everything we’d been doing on digital was still not enough and actually the penny sort of dropped that if we really scaled this up . . . over the next couple of years, it

might actually allow us to do in a different way what we’d been seeking to do with an acquisition.¹⁰

Piyush Gupta
CEO, DBS

The need to leverage digital technology was also becoming apparent with the changing face of the Asian consumers. In Asia, there were over 700 million digital banking users in 2014 and this was expected to grow to 1.7 billion by 2020.¹¹ Generally younger and more mobile-centric, the new Asian consumers were leading the adoption of smartphones and might prefer to be engaged very differently. (See **Exhibit 4** – APAC Digital Adoption.) This could be seen in the fast growth of digital banking in Asia. In 2011-2014, digital banking penetration in the developed markets, including Singapore, Hong Kong and Taiwan, rose from 59% to 92% and smartphone access had grown more than three times.¹² In the emerging economies, the penetration rate was 33% in 2014, up from 10% in 2011, while mobile banking grew from 5% to 26%. (See **Exhibit 5** – Digital Banking Asia.) Moreover, 82% of Asia-Pacific HNWIs expected the relationship with their private bank to be mainly conducted through digital channels in the next five years, compared to 61% in the rest of the world.¹³

To stay relevant as DBS strengthened its presence and reach across the Asian markets, a strategic thrust was to put technology at the core of its banking business. It was an imperative that demanded a radical ‘rewiring’ of the entire organization for the new digital era:

The point about moving to information and mobile is that we need to re-think what our business strategy is and how our business model is going to change. It is not just about developing mobile apps but about

8 Capgemini and RBC Wealth Management Asia-Pacific Wealth Report 2014.

9 Bird-watching CEO Gupta Seeks Returns as DBS Expands in Asia. (2012, February 8). *Bloomberg*.

10 Grant, J. (2014, April 29). Singapore’s DBS Calls For Digitalisation of Banking. *Financial Times*.

11 Digital banking in Asia: Winning Approaches in a New Generation of Financial Services. (2014). *McKinsey & Co.*

12 Digital banking in Asia: What Do Consumers Really Want? (2015, March). *McKinsey & Co.*

13 Capgemini and RBC Wealth Management Asia-Pacific Wealth Report 2014.

14 IDA. (2014, April 3). *Discussing the Evolution of Mobile Connectivity*, [Blog post]. Retrieved May 4, 2015, from <http://www.ida.gov.sg/blog/insg/ict-enterprises/discussing-the-evolution-of-mobile-connectivity/>

*re-thinking the organization. How do you rewire an organization for mobility?*¹⁴

David Gledhill
Head of Group Technology & Operations, DBS

REWIRING DBS FOR THE DIGITAL ERA

Reorganising Technology & Operations (T&O)

As part of the reorganisation, the Technology Division and Operations Division were merged to form a new Group T&O under David Gledhill, who reported directly to the CEO. David was also included as a key member on the central executive board, which steered the bank's business strategies.

As the Head of Group T&O, David was responsible for the division comprising over 6,000 staff across the region. The new T&O structure was carefully aligned with the respective business lines and also the geographical markets, as the T&O teams needed to be "very, very close to business, to add business value through technology."¹⁵ The various T&O heads of consumer banking, institutional banking, etc., reported to David. At the same time, the respective country T&O heads also reported to him. (See **Exhibit 6 – T&O Structure**.) These T&O teams typically comprised project managers, business analysts and system analysts dedicated to understanding the unique business lines or local market requirements.

T&O started an operational excellence programme to improve the bank's key processes by applying lean principles. In 2010, Piyush mandated process improvements for all new T&O projects and through such streamlining, S\$60 million savings were achieved in the first year. The early success prompted the CEO-led improvement programme to be extended organization-wide and all employees were encouraged to contribute process improvement ideas. By 2013,

DBS had eliminated over 240 million hours of customer wait time. The T&O approach was to link the delivery of every project solution to real measureable business outcomes:

*Make sure that you are defining projects and initiatives in terms of solving a well-defined and clearly sponsored business problem as opposed to implementing a piece of technology, measured purely in terms of on time, on budget. Failure to do this will inevitably result in a division (separation) forming between IT and business teams, and the projects being seen as career suicides.*¹⁶

Paul Cobban
Chief Operating Officer, T&O, DBS

Investments into collaborative technology (e.g., unified communication infrastructure, video-telepresence conferencing systems, and enterprise portals) were made to facilitate enterprise coordination and to solicit more feedback from different stakeholders. David explained how he pushed his people to participate in the new development, "We encourage people to speak up, to put their views on the table. We want people with the change agenda. This is a big shift in culture."¹⁷ The institutionalization of an internal portal 'Tell Piyush' in 2010 was for staff across the region to provide feedback or make improvement suggestions to the CEO. The portal was open for specific periods tied to his quarterly town-hall meetings and proved to be an effective channel in getting wider inputs from the ground, cutting through the otherwise layers of bureaucracy in a large firm like DBS. As the CEO shared, "What's important is that (Tell Piyush) has allowed people to feel they were part of the process of (making a) change."¹⁸

¹⁵ David Gledhill to Authors, 2012.

¹⁶ Forrester. (2013, August 23). Q&A with Paul Cobban, [Blog post]. Retrieved May 4, 2015, from http://blogs.forrester.com/dane_anderson/13-08-23-qa_with_paul_cobban_managing_director_coo_technology_and_operations_dbs_bank

¹⁷ David Gledhill to Authors, 2012.

¹⁸ DBS Bank: A Force for Good in Asia. (2013, October 1). *Gallup Business Journal*.

Building Scalable Technology Platforms

The first priority of the new T&O Division was to rationalize and standardize the T&O platforms. To Piyush, many of the business processes needed to manage a regional bank were not yet in place:

Frankly if you go around the countries we do things differently in every place. We don't even have consistent technology platforms across different countries. That is a singular priority for us.¹⁹

DBS wanted to build a technology platform that was not just scalable, but also flexible. Various configurable options were necessary to meet specific country requirements. Asian markets were diverse (multicultural, multilingual) and at different stages of development. Investments were made to acquire configurable enterprise systems, to reverse-engineer and modernize the legacy systems, and to adopt service-oriented architecture and enterprise application integration technologies.

Our belief is to get to the back end, to sort out the pipes. This requires vast amount of work in the back-end infrastructure, integration layers, messaging and all the associated innovations you need to make your architecture nimble. Getting the core right is where we really put our heavy spend. It will speed up the front-end. We build world-class systems on top of that.²⁰

David Gledhill
Head of Group T & O, DBS

Until banks can completely change and enable the back end to allow digital instant fulfillment, you will not get through digital banking. We are spending billions of dollars in digitising the bank. Less than 10% of it is in the frontend apps. 90% of it is in digitising the middle and the back.

How do you digitise the back end, and create middleware around it that allows seamless connectors and connectivities into front end?²¹

Piyush Gupta
CEO, DBS

Sorting out the 'back-end' technology platforms required a careful development of its enterprise architecture as T&O worked closely with their business counterparts to rationalize the range of banking applications that best handled its various operations. (See **Exhibit 7** – Technology Roadmap.) The proactive engagement with business users included a disciplined process of managing deviations. Every deviation had to be justified with plans to realign in the future, and these deviations were logged, reviewed and re-justified not just once, but every year.

DBS' new core banking system, Finacle, was deployed across 12 countries in 28 months. The common operating platform comprised a core banking suite of standardised applications including trade, accounting ledger, capital reporting, interfaces with Internet banking and other channels. New functionalities in customer management, liquidity management were also introduced. In addition, the successful modernization of the legacy core banking system in Singapore and Hong Kong also enabled rapid roll-out of new products, for example, RMB-denominated investment or insurance plans. The new operating platform allowed for greater flexibility in catering to different country-specific preferences or different product packaging features (tiered pricing, rebates, loyalty points).

In 2011, DBS launched a new wealth management platform with integrated consumer/retail banking and private banking functionalities, first of its kind in Asia. It developed a 'wealth continuum' to better service each customer segment, targeting specifically the transition of customers from middle class to high-end segments. The integrated banking platform facilitated a seamless

¹⁹ Wright, C. (2010, September 20). Piyush Gupta's Plans for DBS. *Euromoney*.

²⁰ David Gledhill to Authors, 2012.

²¹ Tan, N. (2015, May 6). Singapore Well-Poised to Build Vibrant FinTech Sector. *Channel NewsAsia*. Retrieved May 4, 2015, from <http://www.channelnewsasia.com/news/business/singapore/singapore-well-poised-to/1829460.html>

customer experience, as it enabled retail customers with growing assets to access not just the retail banking platform (e.g., to manage their checking accounts, credit cards, funds transfer, mortgages) but also the wealth management functionalities in private banking to manage their growing assets (e.g., to manage their trading accounts, multi-currency deposits, investments in financial products, consolidated portfolio management). Building on a strong mass affluent regional client base, DBS' wealth management income doubled from S\$506 million in 2010 to S\$1.1 billion in 2014.

IDEAL™ 3.0—DBS' internet and mobile banking platform for businesses—was launched in 2012 to augment its transaction banking capabilities. IDEAL™ offered corporates a customizable dashboard to manage cash and trade finance transactions via straight-through processing, and access to consolidated statements and forex functions. Designed as a region-specific solution, IDEAL™ could incorporate each country's language and be seamlessly integrated with each market's core banking technology as well as with the client's business processes and internal ERP systems. In 2014, 53.8 million transactions and enquiries were conducted on IDEAL™, which was accessed by 137,700 companies across 120 countries.²²

While these technology platforms were typically best-of-breed systems provided by external vendors, DBS was able to stay responsive to business demands through the active development of its strong competency in technology integration, a critical competency necessary for devising sound business solutions. As noted by David:

*To be able to integrate technology is a core (competency) in a firm. My option to choose best-in-class technology is probably right for a bank the size of DBS. So, my real value proposition has been to develop good technology integration expertise! We need that in-house. We can't be outsourcing our brain!*²³

Designing a New Customer Experience

In 2010, DBS set up a Customer Experience Council chaired by the CEO to drive the strategic agenda of Asian Service. In a move that was indicative of the bank's emphasis on technology in enhancing customer engagement, Piyush aligned the reporting line of the Head of Customer Experience to the Head of Group T&O. The intention was to foster a mindset shift that would go beyond just developing a culture of customer service excellence but also a culture of digitally enabling the new customer experience.

*Digital banking goes beyond creating mobile apps or enabling transactions. It is about leveraging world-class technology to create a first-class customer experience. We have been very focused on executing against our IT strategy that allows us to be more nimble and innovative in the ways we engage our customers, including changing the way people bank.*²⁴

David Gledhill
Head of Group T&O, DBS

A first initiative was a strategic focus on data to drive decisions or align priorities to better serve customers. Made possible with the technology, statistics on customer pain points were systematically collected and analysed as DBS increased its use of data analytics. For example, T&O analysed the transactional statistics of its call centres and found that out of the 86,000 touchpoints in a month, only 20,000 touchpoints captured information on why customers were contacting the bank. T&O then started a programme of tracking and analysing customer pain points in their transactions with DBS.

Another application of analytics was DBS' ATMs, which had among the most features in the world (including bill payments and purchase of insurance). The average number of transactions for its 1,100 ATMs in Singapore was 7-8 times higher than the global average, processing over 25 million transactions a month.²⁵ By

²² DBS Annual Report 2014.

²³ David Gledhill to Authors, 2012.

²⁴ Choudhury, A. (2015, March 16). Using IT to be nimble and innovative. *The Business Times*.

using analytics and sensors embedded in the Machine-to-Machine communication of its ATM network, DBS was able to accurately predict usage and customer withdrawal patterns for each machine and this helped the bank optimise its cash reloading schedule at non-peak times.²⁶ The successful development and diffusion of such analytics helped DBS to cut its ATM cash-outs by over 90% and recover the project cost in 18 months, while the number of customers affected by the reloading was reduced by 350,000 in a year. The number of trips required to reload the network was reduced 10% while the amount of leftover cash returned to the bank decreased by 30%.

Customer touchpoints such as ATMs - merely output channels previously - now became a customer sensor point for us, delivering real-time information that can be used to form a bigger and better picture of customers and their needs.²⁷

Piyush Gupta
CEO, DBS

Moreover, DBS was the first bank in Singapore to implement voice analytics technology in 2012. Conversation streams were analysed to understand customer issues and to help optimise the procedures at its call centre, which handled over five million calls a year. Key phrases commonly used by customers to DBS operators were highlighted by the analytics programme, which allowed the bank to identify calls requiring longer handling times, repeated calls from the same person, as well as specific patterns in customer interactions, so as to better address their needs and pre-empt their complaints. As a result, its customer relationships benefited as compliments rose 45% from the previous year while complaints were down 17%. The technology also improved the centre's operating and workflow efficiency. The time required to meet each user request fell 5% since the system was adopted, or 16 seconds per call, which saved the bank about 107 staff hours a year.

Since speech analytics, DBS had continued to develop new analytics capabilities through its unified desktop and data warehouse solution, enabling its customer center to correlate richer transaction and customer behavior data to predict call reasons and enable customer service officers to address customer needs more effectively.

In addition, DBS actively incorporated human-centred design thinking to reimagine the new customer experience. A customer journey design laboratory was established in 2013 to put DBS staff in the customers' shoes as they learned to map the customer experiences and seek to understand issues encountered by customers across multiple touchpoints.

What we do is we look at the journeys our customers are taking and then we try and get inside the mind of the customer, feel like we are the customer. We actually create a pretend customer that represents our base. We give them a name and age and occupation, and then we take them through the journey as they apply for a mortgage or applying for a credit card, and we try to understand what they are going through. We consider what they are thinking, what are their emotions, what is their experience, what they are concerned about, and then try and improve that process so their journey is more joyful.²⁸

Neal Cross
Chief Innovation Officer (CIO), DBS

For example, after observing that its customers spent 15,000 hours a month at the ATMs to view account balances, DBS launched SMS banking services in 2014 for customers to conduct basic transactions, including check balances, pay card bills and do fund transfers to their own accounts, outside of the online environment. For the convenience of its customers, DBS also added alternative banking touchpoints as more transactions occurred outside of the traditional

²⁵ An average ATM in the U.S. dispenses about 2,000 cycles a month. DBS' average ATMs do 20,000 cycles a month. Fitzgerald, M. (2014, January 6). DBS Pumps Up the Volume on its Technology. *MIT Sloan Management Review*.

²⁶ DBS was awarded "Most Innovative Use of IT" in the Singapore National Infocomm Awards 2014.

²⁷ Banking's Technology Challenge. (2013, May 29). *The Business Times*.

²⁸ Paperny, D. (2015, February 18). An Interview with Neal Cross. *FST Media*. Retrieved May 4 2015, from <http://fst.net.au/knowledge-centre/interview-neal-cross>

bank branches, e.g., through self-service kiosks and CashPoint partnerships²⁹ (e.g., with Guardian Pharmacies, Sheng Siong supermarkets, 7-Eleven stores and SingPost outlets).

Similarly, the design of DBS' new branch model also showcased the intuitive integration of digital technologies as a new customer experience. In these branches, customers were greeted by DBS branch ambassadors at the entrance. The branch featured digital services such as iPads in the waiting area, virtual queuing, electronic forms, and a separate Quick Serve Counter for non-cash transactions that could be completed in 15 minutes. In particular, the specially designed Consultation Pods (workstations) were able to offer a wide range of banking services such that the full personal attention could be paid to the customers:

What we've built into these pods is enough technology, so 95% of the interaction can be done without the person leaving their seat. That's where the technology comes in, but we actually hide it away. It's kind of hidden behind the teller, and it's something the customer doesn't see.³⁰

David Gledhill
Head of Group T&O, DBS

Digital is all about making what can be seen unseen – making services so smooth and seamless that it becomes invisible to the customer.³¹

Neal Cross
CIO, DBS

In early 2015, DBS was the first bank in Singapore to introduce a SMS 'Q' service, where one could obtain via SMS a queue number and the estimated wait time prior to a branch visit. As this freed up customers' time, they became more amenable to speaking with

staff and this resulted in double-digit sales growth for bancassurance and investment products at the branches.³²

Incubating Technology-driven Innovation

In parallel with the effort to enhance customer experience through technology, DBS also established a dedicated focus to leverage the digital edge in reinventing itself to leapfrog the competition. An Innovation Council chaired by the CEO was established in 2010. Again, the CIO reported to the Head of Group T&O, to ensure that the experimentation and incubation of innovative ideas would align well with new digital possibilities.

Specifically, some areas with high-impact potentials (e.g., mobile banking and e-payment, big data analytics, SME banking, wealth management) were identified by the Innovation Council for systematic incubation. In addition, DBS conducted innovation training workshops for staff, profiled and recruited people with strong 'innovation potential' (for example, based on ideation competence, future-orientation). Innovation stories in DBS were compiled and circulated to boost staff confidence. Being innovative and 'catalysts for change' also became key attributes that DBS sought in its employees.

Mobile Banking and E-Payments

A key focus was on mobility innovation because "(with smartphones) we (DBS) see customers touching us more frequently, and it eliminated one degree of friction (for us to reach out to customers)."³³ DBS' key markets in Singapore and Hong Kong had high smartphone penetration (87%) and were excellent test-beds for its suite of 19 mobile apps, which included share trading, insurance and shopping. Notably, DBS PayLah! – a mobile wallet for peer-to-peer (P2P) fund transfers via a smartphone – was launched in 2014 and it attracted over 5,000 users within a week, making it

²⁹ Part of POSB CashPoint – an alternative cash withdrawal option for customers.

³⁰ Fitzgerald, M. (2014, January 6). DBS Bank Pumps Up the Volume on its Technology. *MIT Sloan Management Review*.

³¹ Cross, N. (2014, July 22). What's your definition of 'digital' in banking? *The Financial Brand*. Retrieved June 4, 2015, from <http://thefinancialbrand.com/41151/defining-digital-in-banking-nextbank-facebook/>

³² Boon, R. (2015, March 27). Need for banks to boost tech to engage clients. *The Straits Times*.

³³ Seow, T.C. (2014, February 19). DBS' David Gledhill discusses leadership in banking IT. *CIO Asia*. Retrieved May 4, 2015, from <http://www.cio-asia.com/tech/industries/dbs-david-gledhill-discusses-leadership-in-banking-it/>

the top finance app in the Singapore iTunes store. Users grew to 200,000 in six months. To complement Paylah!, DBS piloted a point-of-sale app for retailers to accept mobile payments. In 2012, DBS was also the first bank in Singapore to offer customers a virtual credit card using Near Field Communication (NFC)-enabled mobile devices to make contactless payments at 30,000 merchants.

Targeting a crop of younger and mobile customers, a home-search mobile app, i.e., the HomeConnect app was launched in 2013. Homebuyers could check a property's valuation by pointing their mobile at the building to access transaction prices in the area and the estimated monthly loan repayments. The DBS Quick Credit app also allowed customers to apply for unsecured loans on their mobiles and receive instant updates on their applications. The app's optical character recognition technology enabled customers to submit the necessary information easily to the bank by scanning their relevant documents directly.

Users of DBS' mobile banking platform saw exponential growth from 225,000 new users, when it was launched in 2010, to 1 million users in 2014, and over 24 million and 11 million transactions made via Internet and mobile, respectively, each month.³⁴ Swiss research firm, MyPrivateBanking, named DBS the world's best for mobile apps strategy in 2013-2014.

Advanced analytics

Another focal area of its technology-led innovation was in advanced analytics. A new analytics competency centre was set up to accelerate the drive of its Business Analytics Master Plan as DBS sought to deepen its understanding of customer footprints for more personalized interactions. Two new advanced data analytics partnerships were initiated. First, DBS would harness big data through IBM's Watson cognitive computing technology, which would be deployed to wealth management and subsequently be rolled out to other business lines. The Watson Engagement Advisor solution involved the use of artificial intelligence to glean insights on market research and transactional behaviours in guiding relationship managers to offer advice tailored to a client's risk appetite and desirable

investment portfolio. The second collaboration was with Singapore's A*Star Institute for Infocomm Research, which had over 600 scientists and engineers, to further develop the bank's analytics capabilities.

Social media

Not all innovation projects were championed from DBS corporate HQ in Singapore. The culture of innovation was also actively fostered in its regional offices. uGOiGO™ was an online time deposit group-buy campaign started by DBS Hong Kong in 2013, targeting affluent customers using social media. More attractive tiered interest rates for time deposits would be triggered once the deposit amounts hit specific targets. The uGOiGO™ microsite generated over 64,000 page views and acquisition of new DBS Treasures customers grew 147 times compared with the traditional means of customer acquisition. Total new deposits exceeded the original goal by 80% and many of these customers were new to DBS. The viral effect of the group-buy campaign was so effective that the idea was quickly trademarked and replicated across the region. In Singapore, the campaign met its 100% target in just five days.

Social media was also actively tapped as DBS made an effort to connect with the community's local culture and social networks in its regional marketing initiatives. In Taiwan, DBS launched a series of stickers featuring its mascots, 'forex experts' Xing and Jaan (the bank's name in Chinese), for LINE – Taiwan's most popular social networking app, which drew over two million downloads in three hours.³⁵ DBS India produced a series of online films – Chilli Paneer – uploaded on a microsite and the bank's YouTube channel, on India's favorite topics: food, love, cricket and Bollywood, and how DBS integrated with customers' daily lives. The brand awareness campaign was well-received and resulted in 600,000 engagements and a sequel.

Along with the development of these creative solutions internally, DBS sought external partnerships (e.g., SAS, universities) to expand its innovation ecosystem. Neal Cross, CIO of DBS, also cast the net wide for innovative ideas. For example, DBS actively engaged the tech startup community such as the

³⁴ DBS Annual Report 2014.

³⁵ Choudhury, A. (2015, March 16). Using IT to be Nimble and Innovative. *The Business Times*.

Startupbootcamp FinTech³⁶ accelerator programme in Asia. As part of its talent development programme, DBS organized a series of hackathons in 2014-2015. Over 250 of its selected employees worked with 160 startup members and developed 50 prototypes to solve future banking challenges. According to Neal, "We've a very high ratio of 'idea to commercial product.' For normal hackathons, it's 1 in 20-50. For crowdsourcing, 1 in 200. We're getting 1 in 4."³⁷ Referring to DBS' "fail fast, learn fast" innovation approach, he elaborated:

We need to fundamentally educate the bank in another way. We experiment – try things quickly – so we start to act a bit more like a startup, like an e-commerce company. It is about taking small, calculated risks that have no impact if they fail. This year we are running 1,000 small experiments across the bank and they will be exactly that, small things we can test in safety that give us a huge amount of insight to action.³⁸

ASIAN BANK OF THE FUTURE

The substantial investment in technology as a foundation for growth appeared to have paid off for DBS. The bank delivered 22 consecutive quarters of year-on-year growth and its income and earnings in 2014 reached a record S\$9.62 billion and S\$4.05 billion respectively, as its net profit crossed the S\$4 billion-dollar mark for the first time. DBS' share price had also risen from S\$11.48 during the financial crisis in 2009 to a high of S\$20.60 in 2014.³⁹

At the enterprise level, DBS had been successful in transforming senior business executives from

"technology idiots" to become "digital warriors". Its close alignment between business and IT alignment was seen in the strong business ownership of its technology roadmap, with the respective business heads even internalizing the technology roadmap to present their annual strategic IT plans themselves. The role of IT was no longer functional but completely fused with the bank's business strategy.

But even with the impressive results and the growing business enthusiasm on the digital agenda, Piyush was candid on the rapid pace of change DBS had to endure, "We have to learn how to change our clothes while running around the hall".⁴⁰ He was acutely aware of the potential disruptions and threat of disintermediation from new market entrants. In Asia, non-traditional players were making inroads into the banking space, including Paypal, WeBank (backed by Chinese social media company Tencent), and Alipay (Alibaba's third-party online payment service). Alipay's online investment fund, Yuebao, attracted US\$92 billion in deposits from about 150 million users, making it the world's fourth-largest money market fund in its first year of operation. Such non-banking competitors were projected to account for at least 30% of retail bank revenues in 2020.⁴¹ Navigating this dynamic digital banking terrain was certainly no easy path. For example, although the uGoGo™ campaign was highly successful in North Asia, it was less successful when the same idea was launched in some countries in Southeast Asia.⁴²

As DBS continued to grow in Asia, what should be the next steps in its digitization strategy? Where should the bank direct its technology investment dollars? How can DBS stay at the forefront of banking innovation to become the Asian Bank of Choice of the future?

36 Fintech refers to a new generation of financial technology startups that are revolutionizing the financial industry, from payment to wealth management, peer-to-peer lending and crowd-funding. Goldman Sachs estimates the market to be worth about US\$4.7 trillion. Retrieved May 4, 2014, from http://www.parksquare.com/uploads/insights/TheFutureofFinance_Part_3_03-13-15.pdf

37 Louisse, D. (2015, March 12). *Insights into Singapore's Startup Scene: DBS CIO Neal Cross*. e27.

38 Wheatcroft, C. (2015, February 24). Digital is a Spectrum - At One End It's About Improving Presence But At the Other It's Reinvention. *The Asian Banker*.

39 DBS Annual Report 2014.

40 Tan, J. (2014, June 16). Piyush Gupta Demands A Shift to Digital Banking In Singapore. *Forbes Asia*.

41 Accenture. *The Everyday Bank: A New Vision for the Digital Age*. (2014, June). Retrieved March 1, 2015, from <http://www.accenture.com/SiteCollectionDocuments/PDF/Accenture-The-Everyday-Bank-A-New-Vision-for-the-Digital-Age.pdf>

42 Tan S.S. (2013, October). *The Evolving Nature of Banking* [Video]. Retrieved May 9, 2015, from <https://www.ted.com/watch/ted-institute/ted-bcg/tan-su-shan-the-evolving-nature-of-banking>

EXHIBIT 1

DBS BANK – GEOGRAPHIC AND BUSINESS MIX

a) DBS Regional Network: Focus on six key markets

• SINGAPORE

- Our home market
- Extensive network of more than 2,500 touchpoints
- Leader in consumer banking, wealth management, institutional banking, treasury and capital markets

• GREATER CHINA

- Hong Kong: Anchor of our Greater China franchise with 49 branches
- China: Locally incorporated in 2007, first Singapore bank to do so; 31 branches and one representative office in 11 major cities today
- Taiwan: Locally incorporated in 2012, first Singapore bank to do so; 43 branches today

• SOUTH AND SOUTHEAST ASIA

- India: 12 branches in 12 major cities, largest network for a Singapore bank
- Indonesia: 40 branches in 11 major cities
- Presence in Malaysia, Philippines, Thailand and Vietnam

• REST OF THE WORLD

- Presence in Japan, Korea, UAE, UK and US to intermediate business and investment flows into Asia

b) DBS Business Mix

	2014	2013	2012	2011	2010
<u>Total income (as % of Group)</u>					
By business unit					
Consumer banking/Wealth management	30	28	29	29	29
Institutional banking	52	52	51	53	50
Treasury	11	12	14	15	17
Others	7	8	6	3	4
By geography					
Singapore	62	60	62	62	63
Hong Kong	20	21	19	19	21
Rest of Greater China	10	8	8	8	6
South and Southeast Asia	6	7	7	7	6
Rest of World	3	3	4	4	4
<u>Net profit (as % of Group)</u>					
By geography					
Singapore	67	65	62	62	64
Hong Kong	23	24	21	19	22
Rest of Greater China	6	3	3	6	2
South and Southeast Asia	1	7	9	9	8
Rest of World	3	2	5	4	5

Figures may not add up due to rounding.

Source: Compiled from DBS financial data 2010-2014.

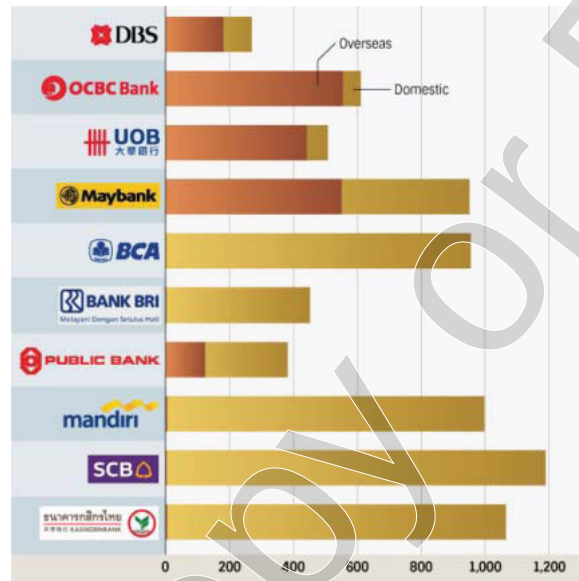
EXHIBIT 2

DBS BANK – KEY FINANCIALS (\$\$)					
Group	2014	2013	2012	2011	2010
Selected income statement items (\$millions)					
Total income	9,618	8,927	8,064	7,631	7,066
Profit before allowances	5,288	5,009	4,450	4,328	4,141
Allowances	667	770	417	722	911
Profit before tax	4,700	4,318	4,157	3,733	3,332
Net profit excluding one-time items and goodwill charges	3,848	3,501	3,359	3,053	2,650
One-time items	198	171	450	-	-
Goodwill charges	-	-	-	-	1,018
Net profit	4,046	3,672	3,809	3,035	1,632
Selected balance sheet items (\$millions)					
Total assets	440,666	402,008	353,033	340,847	283,710
Customer loans	275,588	248,654	210,519	194,720	152,094
Total Liabilities	400,460	364,322	317,035	307,778	250,608
Customer deposits	317,173	292,365	253,464	225,346	193,692
Total shareholders' fund	37,708	34,233	31,737	28,794	26,599
Per ordinary share (\$)					
Earnings excluding one-time items and goodwill charges	1.55	1.43	1.39	1.3	1.15
Earnings	1.63	1.5	1.57	1.3	0.7
Net asset value	14.85	13.61	12.96	11.99	11.25
Dividends	0.58	0.58	0.56	0.56	0.56
Selected financial ratios (%)					
Dividend cover for ordinary shares (number of times)	2.8	2.58	2.79	2.28	1.25
Net interest margin	1.68	1.62	1.7	1.77	1.84
Cost-to-income	45	43.9	44.8	43.3	41.4
Return on assets	0.91	0.91	0.97	0.97	0.98
Return on equity	10.9	10.8	11.2	11	10.2
Loan/deposit ratio	86.9	85	83.1	86.4	78.5
Non-performing loan rate	0.9	1.1	1.2	1.3	1.9
Loss allowance coverage	163	135	142	126	100
Capital adequacy					
Common Equity Tier 1 – Transitional	13.1	13.7	-	-	-
Common Equity Tier 1 – Final	11.9	11.9	-	-	-
Tier 1	13.1	13.7	14	12.9	15.1
Total	15.3	16.3	17.1	15.8	18.4

Source: DBS Annual Report 2014.

EXHIBIT 3

MAJOR ASEAN BANKS - NUMBER OF BRANCHES (AS OF JUNE 2014 UNLESS INDICATED)



OCBC includes branches of Wing Hang Bank acquired in July 2014;
Data for three Indonesian banks, Maybank as of end of 2013, Public Bank as of October 2014

Source: Nikkei Asian Review. Banks Jostle for Position as ASEAN Integrates. (2014, November 6).

EXHIBIT 4

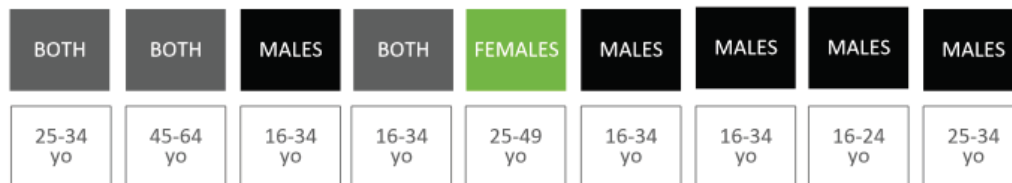
APAC DIGITAL ADOPTION

a) Smartphone Adoption Among Mobile Phone Users

SMARTPHONE OWNERSHIP AMONG MOBILE PHONE USERS



ADOPTION DRIVEN BY

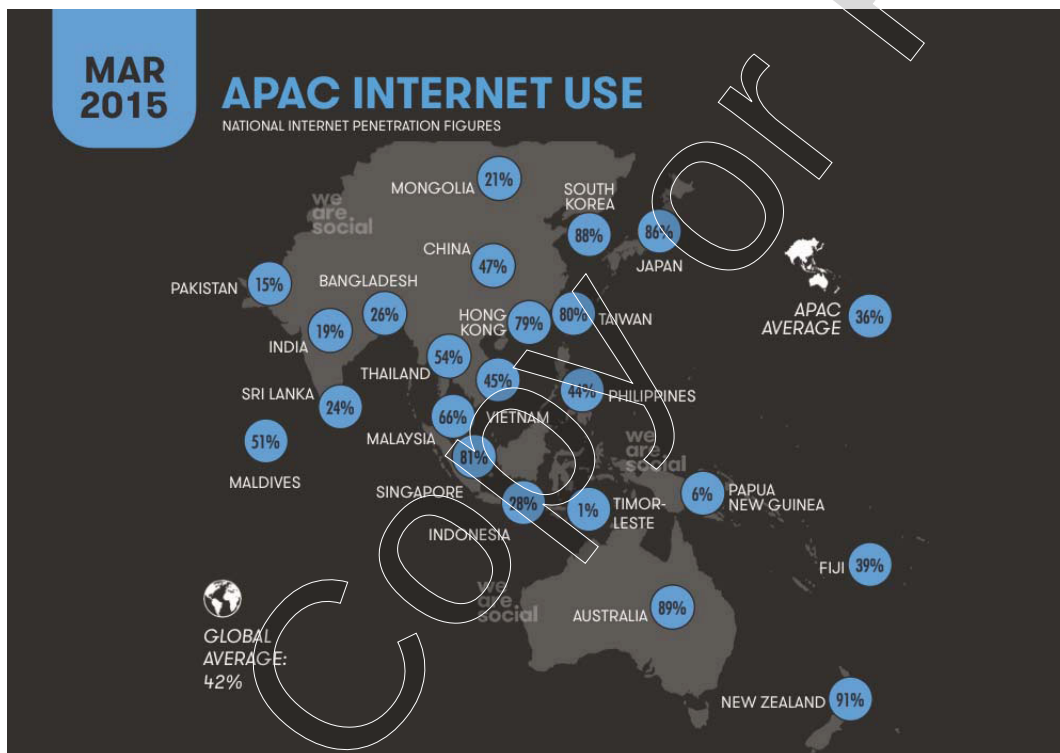


Source: Nielsen Smartphone Insights 2013.

EXHIBIT 4
(CONTINUED)

APAC DIGITAL ADOPTION

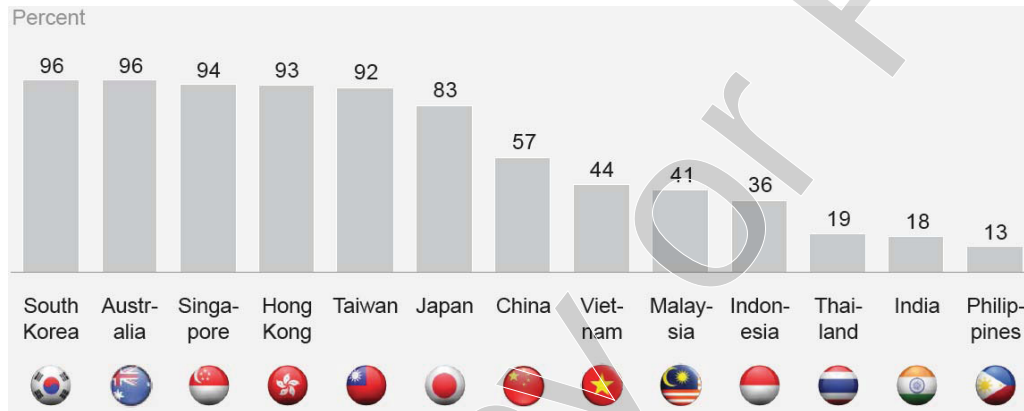
b) Internet Penetration



Source: We are Social and IAB Singapore. *Digital, Social & Mobile in APAC 2015*. Retrieved June 6, 2015, from <http://wearesocial.sg/blog/2015/03/digital-social-mobile-in-apac-in-2015/>

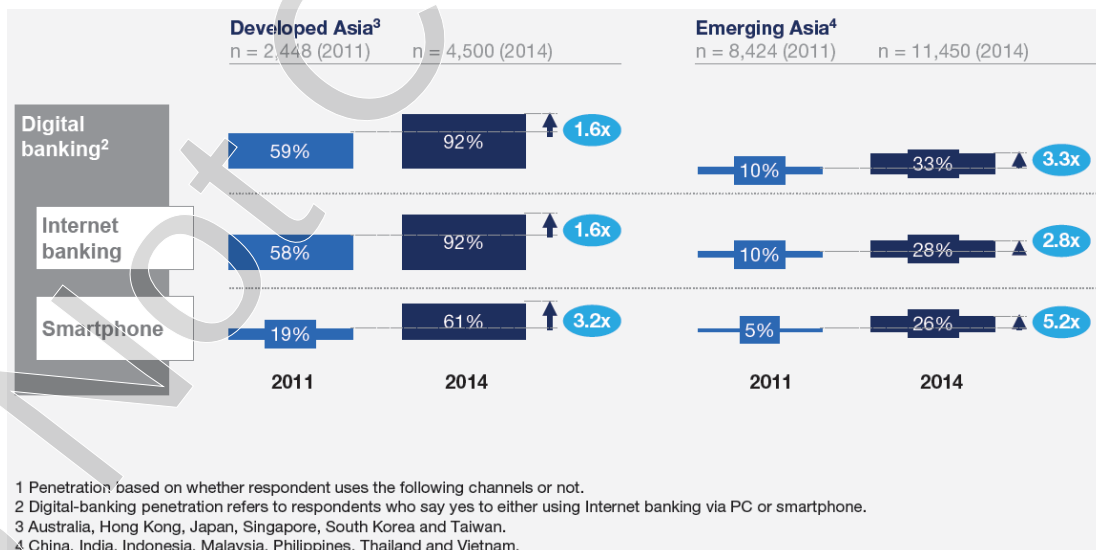
EXHIBIT 5 DIGITAL BANKING IN ASIA

i. Digital Banking Penetration in Asia (2014)



Note: Digital banking penetration is defined as the number of users of internet or smartphone banking divided by total banking consumers in each country; only urban consumers included.

ii. Banking Channels Penetration¹

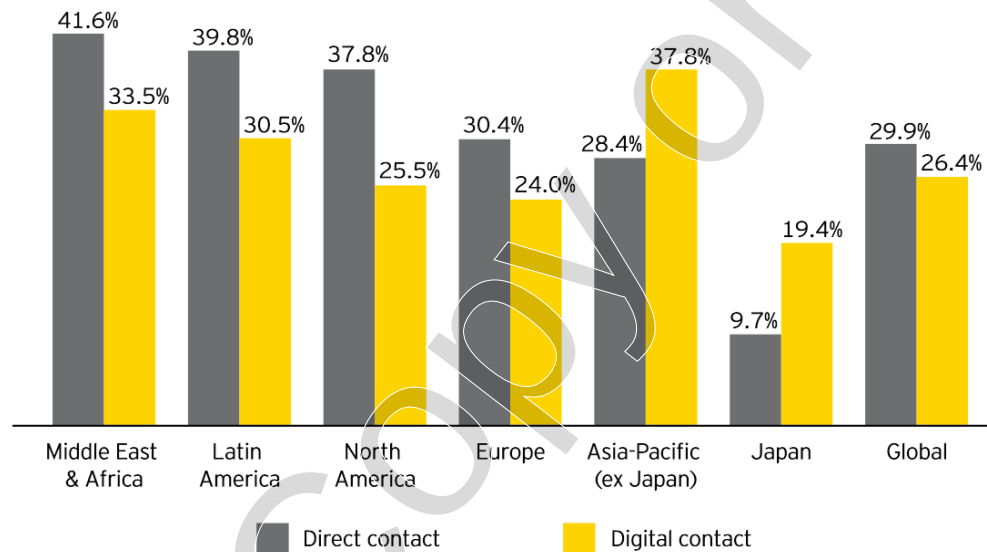


Source: McKinsey Asia Personal Financial Services Survey 2014.

EXHIBIT 5
(CONTINUED)

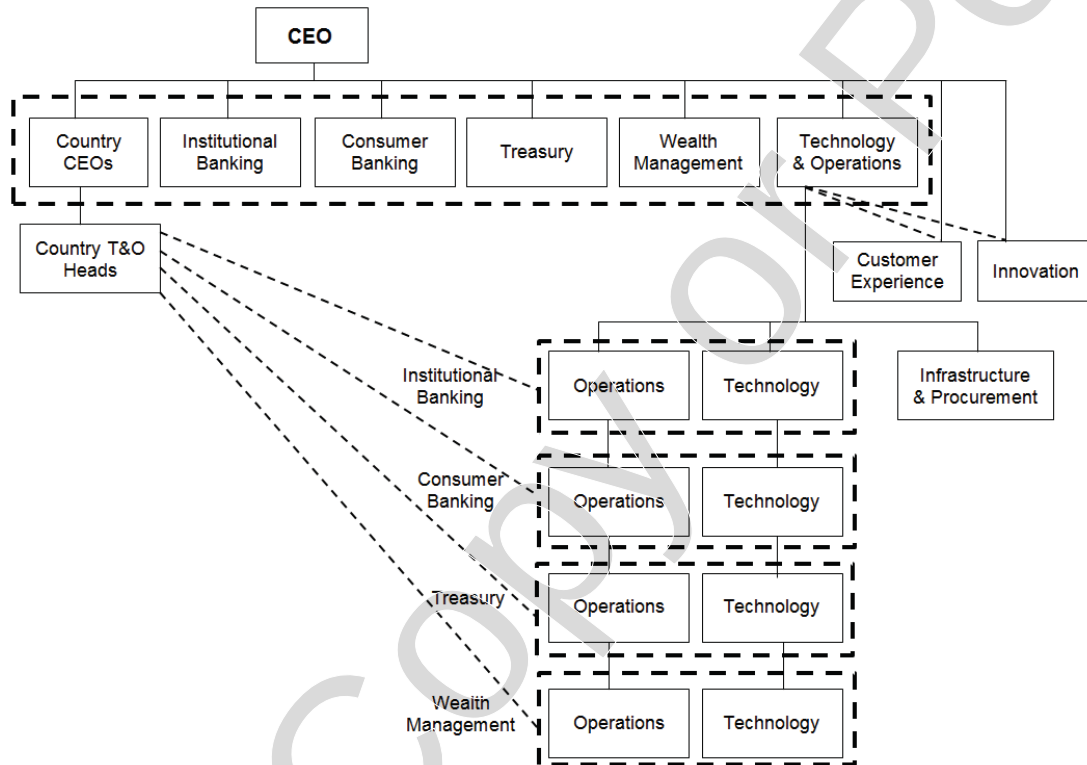
DIGITAL BANKING IN ASIA

iii. Asia-Pacific HNWIs led the world in their preference for digital relationships rather than direct contact with their wealth managers.



Source: CapGemini, RBC Wealth Management and Scorpio Partnership Global HNW Insights Survey 2014.

EXHIBIT 6 DBS T&O STRUCTURE



Source: DBS to Authors.

EXHIBIT 7 DBS TECHNOLOGY ROAD MAP

		Standardized	Not Standardized	To Be Standardized						
		Country A		Country B	Country C	Country D	Country E	Country F		
PRODUCTS	System 1.1	System	System				System			
	System 1.2	System					System		System	
	System 1.3	System					System		System	
	System 1.4	System	System			System			System	
CHANNELS	System 2.1	System			System		System		System	
	System 2.2	System							System	
FUNCTIONS	System 3.1	System							System	
	System 3.2	System						System		
	System 3.3	System			System				System	
	System 3.4	System	System		System					
	System 3.5	System								
	System 3.6	System	System		System		System			
	System 3.7	System	System						System	
INTEGRATION	System 4.1	System	System							
	System 4.2	System							System	
	System 4.3	System					System		System	

Source: DBS to Authors.