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How DBS Bank Pursued a Digital Business Strategy

Business digitalization is changing the competitive landscape in many industries. Digitally savvy customers are demanding more while threats of digital disruptions from new entrants are rising. This article describes how DBS, a large Asian bank, responded to digital threats and opportunities by adopting a digital business strategy. It identifies the capabilities needed and provides lessons for organizations aspiring to pursue a successful digital business strategy.[1]

Siew Kien Sia
Christina Soh
Nanyang Technological University (Singapore)

Peter Weill
MIT Sloan School of Management (U.S.)

Banks Need to Adopt a Digital Business Strategy

Business digitalization is changing the competitive landscape for many industries, and the banking industry is no exception. With the rapid adoption of the Internet, ecommerce and smartphones, consumers are increasingly turning to computers, tablets, mobile phones and smartphones to interact and transact with banks. As a consequence, because bank customers are visiting branches less frequently, the number of physical bank branches has declined steadily over the years. This trend will likely continue—for example, McKinsey sees a sharp rise in digital banking consumers, estimating that the number in Asia will rise from 670 million in 2016 to 1.7 billion by 2020. At the same time, a new breed of digital players is entering the finance industry. Referring to the growing threat of the "fintech"[2] revolution, JP Morgan Chase Chief Executive Jamie Dimon cautioned in a letter to shareholders that "Silicon Valley is coming" to the banking sector.[3] Such digital disruptions can destroy significant value for banks—McKinsey estimates that 30% to 50% of net profit in banks could be at risk.[4]

Banks have begun to respond to the digital challenge. For example, Hana Bank in South Korea launched its N mobile platform, which allows customers to use their smartphones to withdraw cash from ATMs, send money and pay at stores.[5] Money management functionalities, location-based offers and credit facilities are also integrated into the platform.

1 Dorothy Leidner is the accepting senior editor for this article.
2 Fintech refers to a new generation of financial technology startups that are revolutionizing the financial industry, from payment to wealth management to peer-to-peer lending to crowdfunding.
3 Dimon, J. "Letter to shareholders," *JP Morgan Annual Report*, 2014, available at http://files.shareholder.com/downloads/ONE/15660259x0x820077/8af78e45-1d81-4363-931c-439d04312ebc/JPMC-AR2014-LetterToShareholders.pdf.
4 *Digital Banking in Asia: winning approaches in a new generation of financial services*, January 2014, McKinsey & Company, available at http://www.mckinsey.com/~/media/mckinsey%20offices/singapore/2014%20digital%20banking%20in%20asia%20-%20winning%20approaches%20in%20a%20new%20generation%20of%20financial%20services.ashx.
5 Baxter, M. and Vater, D. *Building the Retail Bank of the Future*, Bain & Company, June 18, 2014, available at http://www.bain.com/publications/articles/building-the-retail-bank-of-the-future.aspx.

However, many banks are finding it challenging to respond to the digital threats and opportunities and are struggling to compete in an increasingly digital marketplace. They are often weighed down by their legacy IT systems and cumbersome legacy processes. Burdened by heavy compliance requirements, these banks also have little capacity to experiment with digital innovation. Yet digitalization hits at the core of a bank—i.e., the digitalization of money and all the related functions around money.

IT is not just critical in the running of banking business but is also an important source of banking innovations and has strategic implications for future banking models. Hence, it is not sufficient to simply align functional IT strategy with business strategy. IT needs to be pervasively embedded in every aspect of a bank and be an integral part of the business strategy. The IT strategy of a bank is thus inextricably fused with the business strategy. Bharadwaj et al. termed this fusion of IT strategy and business strategy digital business strategy.[6] How can a bank pursue such a digital business strategy? How can it be transformed or "rewired" to achieve the fusion between business and IT so it can respond to the new digital threats and opportunities? These are the questions that this study aims to address.

Pursuing a Digital Business Strategy

Best practice for pursuing a digital business strategy is still in its infancy. Most organizations simply respond to new digital threats and opportunities in an ad hoc manner within some organizational functions. For example, some firms have embraced social media as part of their digital initiatives within their marketing functions but do not actively link these initiatives back to their core IT infrastructure.[7]

Similarly, many banks have begun exploring the digital realm—most often by offering current banking services through online or mobile channels (e.g., launching new websites or mobile banking apps). For example, Commonwealth Bank of Australia engaged with its customers throughout the entire home-buying process by integrating a property listing database and the full range of mortgage services on a simple mobile app.[8] Other banks are also experimenting with innovative digital offerings, but often within a particular business function or division.

Moving forward, however, there is a growing sense that such functionally oriented experiments fail to maximize the potential of digital business strategy. A digital business strategy is inherently cross-functional and thus requires simultaneous development and reconfiguration of IT and business resources across multiple organizational processes. A more holistic and integrated approach is needed if companies are to respond effectively to the threats and opportunities arising from digitalization. To do so, companies need to develop several related capabilities in the areas of leadership, operations, customer needs and innovation.

Leadership. CEOs need to be transparent, adaptive and resilient, and senior executives must acquire new competencies.[9] The senior management team must be "ambidextrous,"[10] able to understand the potential and challenges of digitalization and have a shared vision of digitalization being central to the growth of the business. Top management leadership is crucial for articulating the digital business strategy and for aligning the necessary investment in resources.

Operations. The pursuit of a digital business strategy requires a robust and flexible enterprise platform on which digital products and services can be readily delivered. These digitized business processes, based on standards and integration strategies, enable flexible service provision and dynamic reconfiguration of the supply chain or business partnerships.[11]

6 Bharadwaj, A., El Sawy, O. A., Pavlov, P. A. and Venkatraman, N. "Digital Business Strategy: Toward a Next Generation of Insight," *MIS Quarterly* (27:2), 2013, pp. 471-662.

7 Hansen, R. and Sia, S. K. "Hummel's Digital Transformation Toward Omnichannel Commerce," *MIS Quarterly Executive* (14:2), 2015, pp. 51-66.

8 Baxter, M. and Vater, D., op. cit., 2014.

9 Bennis, W. "Leadership in a Digital World: Embracing Transparency and Adaptive Capacity," *MIS Quarterly* (37:2), 2013, pp. 635-636.

10 O'Reillu, C. A., and Tushman, M. L. "The Ambidextrous Organization," *Harvard Business Review*, April 2004, available at https://hbr.org/2004/04/the-ambidextrous-organization.

11 Markus, M. L. and Loebbecke, C. "Commoditized Digital Processes and Business Community Platforms: New Opportunities and Challenges for Digital Business Strategies," *MIS Quarterly* (37:2), June 2013, pp. 649-653.

Customer needs. Companies also need to develop the ability to respond swiftly to the demands of a growing number of digitally savvy customers. This requires the digitalization of products, services and customer relationships, and the seamless integration of functional silos across the enterprise. Deeper analysis of the new value propositions to customers in the digitally enabled context is required. These value propositions include benefits such as greater accessibility, higher affordability and wider social connectivity.[12]

Innovation. Companies face the challenges of innovating to continuously stay at the cutting edge of technology and of keeping in touch with evolving customer needs.[13] This requires developing an innovation ecosystem with external partners, including customers. Keen and Williams[14] highlight the new realities of value sources in the broader digital ecosystem; the strategic challenge is to identify and capture these dynamic sources of value, which requires new forms of collaboration, new processes and new infrastructures.

Existing research, however, reveals little about *how* banks can make such a holistic transition. There are few comprehensive accounts on how banks have embarked on such radical enterprise-wide digital transformations. The examples tend to be anecdotal, often just focusing narrowly on a key digital initiative launched by a bank and lacking an in-depth account of the transformation journey. The authors have studied one bank—DBS, based in Singapore—that has radically reorganized (or rewired) itself to pursue a successful digital business strategy (see the Appendix for more on the research methodology). DBS' transformation journey is set out below.

DBS Bank Background

DBS Bank (DBS) has grown from a Singapore bank to become the largest bank by assets in Southeast Asia, providing a full range of financial services for institutional banking, consumer banking and wealth management. DBS' network centers on three key Asian markets—Greater China, Southeast Asia and South Asia—with over 280 branches across 17 countries. Since 2009, when Mr. Piyush Gupta was appointed CEO, DBS has been aggressively investing in IT to create an infrastructure platform for regional growth.

The need for DBS to leverage digital technology was also driven by the changing nature of Asian consumers. In Asia, there were over 700 million digital banking users in 2014, expected to grow to 1.7 billion by 2020.[15] Generally younger and more mobile-centric Asian consumers were leading the adoption of smartphones and preferred to engage with businesses in a very different way. This could be seen in the fast growth of digital banking in Asia. Between 2011 and 2014, digital banking penetration in the developed markets in Asia, including Singapore, Hong Kong and Taiwan, rose from 59% to 92%.[16] In emerging Asian economies, the penetration rate was 33% in 2014, up from 10% in 2011. Moreover, 82% of high-net-worth individuals in Asia-Pacific expected the relationship with their private banks to be conducted mainly through digital channels in the next five years, compared to 61% in the rest of the world.[17]

To strengthen its presence and reach across the Asian markets, DBS formulated a strategy to put technology at the core of its banking business. From 2010 to 2014, the bank spent S$600 million[18] annually on technology. An additional S$200 million will also be committed for the next three years.

> *"Whether we know it or not, the digital revolution has put banks under siege. With Internet 2.0 and mobility, the game has been redefined. 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. It is only a matter of time before the disruption that the retail and telecom industries have*

12 Srivastava, S. C. and Shaniesh, G. "Bridging the Service Divide Through Digitally Enabled Service Innovations: Evidence From Indian Healthcare Service Providers," *MIS Quarterly* (39:1), 2015, pp. 245-267.

13 McKinsey & Company, op. cit., 2014.

14 Keen, P. and Williams, R. "Value Architecture for Digital Business: Beyond the Business Model," *MIS Quarterly* (37:2), 2013, pp. 642-647.

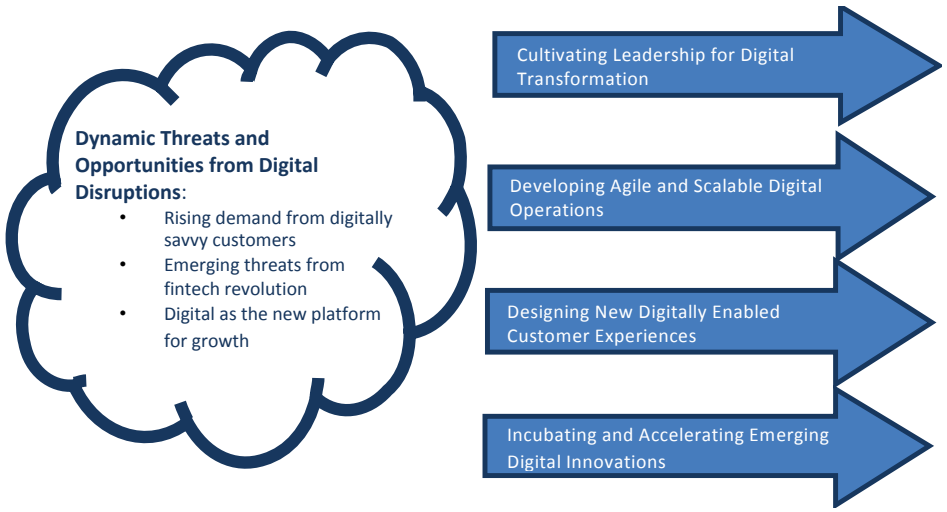
15 McKinsey & Company, op. cit., 2014.

16 Ibid.

17 *Asia-Pacific leads world in wealth growth*, Capgemini and RBC Wealth Management, October 21, 2014, available at https://www.uk.capgemini.com/news/asia-pacific-leads-world-in-wealth-growth.

18 As of April 2016, S$1 = US$0.74.

Figure 1: Key Thrusts of DBS' Digital Transformation Strategy



experienced befalls banking. Monumental change is just around the corner and Bill Gates will be proven right when he said that people need banking, but not banks."[19] Piyush Gupta, CEO, DBS

Rewiring DBS Bank For the Digital Era

The key thrusts of DBS' digital transformation strategy involved strategic initiatives and proactive efforts to (1) cultivate digital leadership among senior executives, (2) build agile and scalable digital operations, (3) design new digitally enabled customer experiences and (4) incubate and accelerate emerging digital innovations (see Figure 1).

> *"The point about moving to information and mobile [digital] is that we need to rethink what our business strategy is and how our business model is going to change. It is not just about developing mobile apps but about rethinking the organization. How do you rewire an organization for [digital transformation]?"*[20] David Gledhill, Head of Group T&O (Technology and Operations), DBS

1. Cultivate Leadership for Digital Transformation

The most vocal champion for digital transformation in DBS was the CEO, Mr. Gupta. Recognizing that banking was undergoing "*cataclysmic disruption*," he personally championed the digital agenda to "*put digital at the heart of banking*." A question that he continually asked his senior executives was how well the business was exploiting the digitalization of banking products and services. Technology was a key component of DBS' overall business strategy. For example, he commented on the use of digitalization in overcoming the constraints of physical banking infrastructure in DBS' regionalization drive:

> *"If we are able to leverage fintech, and offer banking through digital channels, the need for a large geographic footprint in order to scale up in large geographies such as China, India or Indonesia becomes less of an imperative. A successful digital banking strategy will enable us to accelerate our access to emerging markets without the need for a large and expensive bricks and mortar network."* Piyush Gupta, CEO, DBS

The Group Executive and the new Head of Group Technology and Operations (T&O), David Gledhill, reported directly to the CEO and were key members of DBS' central executive committee, which steered the bank's vision and strategic directions. Additionally, senior banking

19 Gupta, P. *Banking Disrupted,* DBS Bank, 2014, available at http://www.dbs.com/newsroom/influencer/default.page.

20 *Discussing the evolution of mobile connectivity*, Info-communications Development Authority of Singapore, April 3, 2014, available at http://www.ida.gov.sg/blog/insg/ict-enterprises/discussing-the-evolution-of-mobile-connectivity.

executives were kept up to date with the latest developments in the digital landscape through various forums to help them see the potential disruptions and threats of disintermediation from new market entrants. For example, Ms. Tan Su San, head of the Wealth Management Division, became more acutely aware of the rapid commoditization of wealth management by online retail investment players (e.g., Fundsupermart in Singapore). As customers bypassed traditional wealth management advisors and put their money directly into funds, the lucrative management fees that banks collect for wealth management services were at the risk of "*becoming history*."

Committed to transforming herself from a "*technology idiot*" to a "*digital warrior*,"[21] Ms. Tan's response to the digital threat was to deploy IBM Watson, a cognitive cloud-based data analytics solution in the Wealth Management Division. IBM Watson helped relationship managers (who may have 100 to 200 clients) analyze complex market and customer data so they could deliver greater value to DBS' customers.

This initiative was just one of the many technology investment decisions jointly planned by senior business and technology executives through their annual technology road-mapping workshops. The close collaboration between business and technology executives was evident in the strong business ownership of the technology roadmap; the business heads, not their IT managers, would present their strategic IT plans to senior executives themselves.

Increasingly, senior banking executives were also encouraged to innovate and think digitally, just like "technopreneurs." Even leadership development programs were revamped and structured as hackathons.[22]

> *"Yes, it's a huge cultural change. In the past, our leadership program has been all about leadership skills, communication skills. We scrapped all of that and our leadership program now is all about hackathons: [we] take every one of our senior leaders for a one- or two-week hackathon. We … mix traditional senior bankers with a bunch of 20-year-old coders and see what happens. It's fascinating to watch. On day 1 or 2, there are two camps, the bankers and coders, neither really sure of what to think of each other. By the end of the week, there's such passion and intensity about what they are creating that we really think we've [ignited] a very magical spark [that] changes people's thinking in the organization."* Neal Cross, Chief Innovation Officer, DBS

The cultivation of leadership for digital transformation was not just restricted to senior executives but also systematically cascaded down the hierarchy to mobilize the change agenda. Investments in collaborative technology (e.g., a unified communication infrastructure, telepresence videoconferencing systems and enterprise portals) facilitated enterprise coordination and the gathering of feedback from different stakeholders. Mr. Gledhill explained how he pushed his employees 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*."

For example, the "Ask Piyush" e-forum was set up in the internal enterprise portal in 2011. This forum encouraged staff across the region to provide regular feedback or make improvement suggestions directly to the CEO. The portal was open for specific periods, timed to coincide with Mr. Gupta's quarterly town-hall meetings. The forum proved to be an effective channel for getting wider inputs from employees, cutting through the layers of bureaucracy in a large firm like DBS. As Mr. Gupta shared, "*What's important is that [the portal] has allowed people to feel they were part of the process of [making a] change*."[23]

2. Develop Agile and Scalable Digital Operations

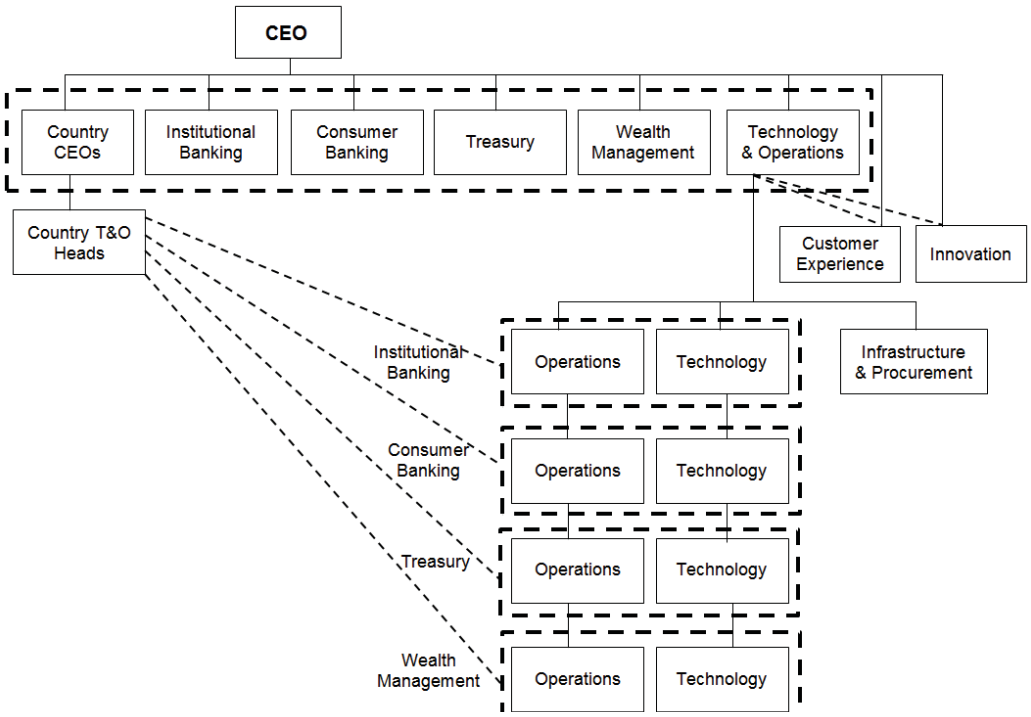
For greater responsiveness, the previously separate Technology and Operations Divisions in DBS were merged to form a new Group Technology and Operations (T&O) Division under Mr. Gledhill. As the Head of Group T&O, he was responsible for over 5,000 employees across

21 Tan, S. S. *The evolving nature of banking*, October 2013, TED Conferences, available at https://www.ted.com/watch/ted-institute/ted-bcg/tan-su-shan-the-evolving-nature-of-banking.

22 Events, typically lasting several days, in which a large number of people meet to engage in collaborative computer programming.

23 Ratanjee, V. "DBS Bank: A Force For Good In Asia," *Gallup Business Journal*, October 1, 2013, available at http://www.gallup.com/businessjournal/164279/dbs-bank-force-good-asia.aspx.

Figure 2: Reporting Structure for DBS' Group Technology and Operations Division



the region. The new T&O structure was also carefully aligned with the respective business lines and geographical markets, because the T&O teams needed to be "*very, very close to business, to add business value through technology*."[24] The T&O heads for the various lines of business (e.g., consumer banking, institutional banking) reported to Mr. Gledhill, as did the respective country T&O heads (through the matrix reporting lines shown in Figure 2). Each T&O team typically comprised project managers, business analysts and system analysts dedicated to understanding the unique business line or local market requirements.

The first priority of the new T&O Division was to rationalize and standardize the technology and operations platforms. According to Mr. Gupta, many of the business processes and technology platforms 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.*"[25]

Although DBS wanted to build a consistent technology platform across countries, the reality was that Asian markets were diverse (multicultural, multilingual) and at different stages of development. Hence, the technology platform had to be not just scalable but also flexible. Various configurable options were necessary to meet specific country requirements. 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 amounts 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."* David Gledhill, Head of Group T&O, DBS

Sorting out back-end technology platforms required a careful development of DBS' enterprise architecture. Thus, the T&O teams worked closely

24 David Gledhill, in an interview with the author, 2012.

25 Wright, C. *Euromoney: Piyush Gupta's plans for DBS*, Christ-Wright Media, September 2010, available at http://www.chriswright-media.com/euromoney-piyush-guptas-plans-for-dbs/.

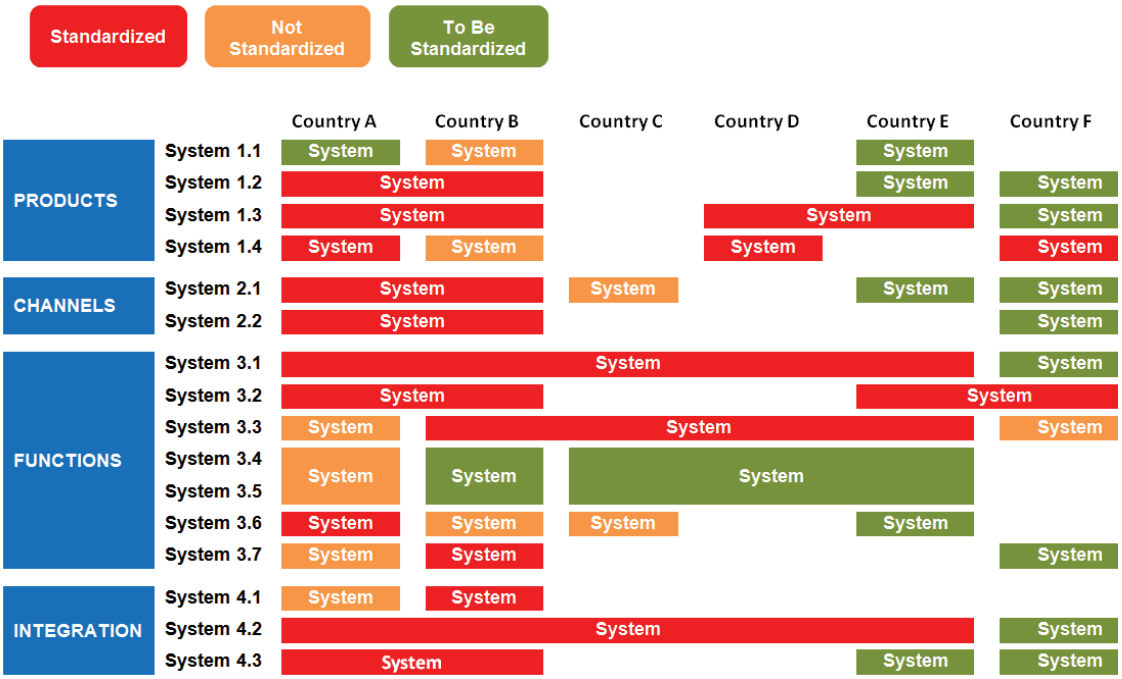
with their business counterparts to rationalize the range of banking applications needed to support their various operations. The changes needed were captured in a technology roadmap that showed the current state of standardization and the areas to be standardized going forward (see Figure 3). The technology roadmap was the cornerstone of a newly created, disciplined process of engagement with business users to manage deviations. Every deviation had to be justified with plans to realign in the future, and these deviations were logged, reviewed and rejustified not just once but every year.

The result of these initiatives was that DBS' new core banking system, Finacle, was successfully deployed across 13 countries in 28 months. The common operating platform comprised a core banking suite of standardized applications, including trade, accounting ledger, capital reporting, interfaces with Internet banking and other channels. New functionalities in customer management and liquidity management were also introduced. In addition, the modernization of the legacy core banking systems in Singapore and Hong Kong also enabled rapid rollout of new products, such as investment or insurance plans denominated in the Chinese currency (Yuan/RMB). The new operating platform allowed greater flexibility in catering for different country-specific preferences or different product-packaging features, such as tiered pricing, rebates and loyalty points.

Another new enterprise-wide platform was the wealth management system, which integrated retail banking and private banking functionalities. This platform was launched in 2011 and was the first of its kind in Asia. It enabled a "wealth continuum" approach to better serve each customer segment, targeting specifically the transition of customers from middle-class to high-end segments. This integrated banking platform facilitated a seamless customer experience. 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 and mortgages) but also 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 regional base of affluent clients, DBS' wealth management income doubled from S$506 million in 2010 to S$1.1 billion in 2014.

The wealth management system was quickly followed in 2012 by IDEAL™ 3.0—DBS' Internet and mobile banking platform for businesses. IDEAL™ offered corporate customers a

Figure 3: DBS' Technology Roadmap



customizable dashboard to manage cash and trade financial transactions via straight-through processing, and access to consolidated statements and forex functions. Designed as a region-specific solution, IDEAL™ incorporated each country's language and was seamlessly integrated with each market's core banking technology as well as with the client's business processes and internal ERP systems. In 2014, IDEAL™ handled 53.8 million transactions and enquiries, and was accessed by 137,700 companies across 120 countries[26]

Although these technology platforms were typically best-of-breed systems provided by external vendors, DBS recognized that a strong in-house competency in technology integration was critical for devising sound business solutions and for staying responsive to business demands. As noted by Mr. Gledhill: "*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!*"

In addition, the T&O Division launched an "operational excellence" program to improve the bank's key processes. In 2010, Mr. Gupta hired a new head of process transformation, Paul Cobban, who was tasked with applying process improvement methods and lean principles across DBS. A result was the mandated requirement for all new T&O projects to undergo process transformation with stretch targets and measurement of outcomes. Cross-functional teams, comprising 10 to 20 people from around the bank (including senior executives and new hires), were tasked with driving these projects.

These process streamlining initiatives resulted in S$60 million of savings in the first year. Because of this early success, the process improvement program was extended organization wide, and all employees were encouraged to contribute improvement ideas. By 2013, DBS had eliminated over 240 million hours of customer wait time. Another T&O initiative was to link the delivery of every project solution to real, measureable business outcomes, thus avoiding the need to classify a project as either an IT or a business project.

> *"Make sure that you define a project 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 divide the IT and business teams, and it would be suicidal for the project".*[27] Paul Cobban, Head of Process Transformation, DBS

3. Design New Digitally Enabled Customer Experiences

In 2010, as the digital platforms were being put in place, DBS also set up a Customer Experience Council, chaired by the CEO. Mr. Cobban's role was expanded, and he became the Head of Customer Experience, as well as Head of Process Transformation, reporting to the Head of Group T&O. The intention was to foster a mindset shift that would go beyond developing a culture of customer service excellence to creating a culture of digitally enabling new customer experiences.

> *"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 to enable us to be more nimble and innovative in the ways we engage our customers, including changing the way people bank."*[28] David Gledhill, Head of Group T&O, DBS

Strategically, the design of new customer experiences was guided by a set of principles from DBS' Asian Service Framework, which drew on the bank's strong Asian heritage. This framework incorporated core Asian values of "respect and humility"—i.e., "We are Respectful, We are Easy and Dependable to bank with."

26 DBS Annual Report, 2014.

27 Anderson, D. *Q&A with Paul Cobban*, Managing Director, COO, Technology and Operations, DBS Bank, Forrester, August 23, 2013, available at http://blogs.forrester.com/dane_anderson/13-08-23-qa_with_paul_cobban_managing_director_coo_technology_and_operations_dbs_bank. Note that Paul Cobban's responsibilities have expanded over the years, and more recently, he took on the role of COO in DBS Bank.

28 Choudhury, A. R. "Using IT to be nimble and innovative," *The Business Times*, March 16, 2015, available at http://www.business-times.com.sg/focus/in-depth/cio-speaks/using-it-to-be-nimble-and-innovative.

The acronym of RED (Respectful, Easy and Dependable) translated into operational principles that were the basis of DBS' continuous search for ways to enhance the experiences of its customers.

> *"Spelling out RED, we define everything we do from the cosmetic touch, feel and look to real service propositions. We play these behaviors or themes out in the way we train the front-service officers, the way we design our products, the way we do process engineering, the way we design our systems. This is a RED attitude, this is a RED product, this is a RED process. It is a real benchmark that everybody can get his head around."* Paul Cobban, Head of Customer Experience, DBS

A second focus was the better use of data to drive decisions in serving customers. DBS actively promoted a new evidence-based culture of managing by facts and numbers, rather than just by intuitions or opinions. Key customer service concepts were developed and operationalized, and the relevant statistics were then systematically collected and analyzed. For instance, metrics such as customer hours saved were formalized as strategic key performance indicators that management carefully tracked. In one example, T&O analyzed the transaction statistics of its call centers and found that, out of the 86,000 touchpoints in a month, only 20,000 captured information on why customers were contacting the bank. As a consequence, T&O started to track and analyze customer pain points in their transactions with DBS. The resulting improvements resulted in a 50% reduction of queue times and saved 100 million customer hours.

Another example of data optimization related to ATMs. DBS' ATMs had more features than most other ATMs worldwide (including payment of bills and airline tickets), and these features led to very high usage. DBS' 1,100 ATMs in Singapore processed over 25 million transactions a month, seven to eight times higher than the global average. By using analytics and sensors embedded in machine-to-machine (M2M) communication of its ATM network, DBS was able to accurately predict ATM usage and customer withdrawal patterns for each machine, and this helped the bank to optimize its cash reloading schedule at non-peak times.[29] This helped DBS to cut its ATM cash-outs by over 90%, while the number of customers affected by cash reloading was reduced by 350,000 each year. The number of trips required to reload the ATMs was also reduced by 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."*[30] Piyush Gupta, CEO, DBS

In 2012, DBS was also the first bank in Singapore to implement speech analytics technology at its call center, which handled over five million calls a year. Key phrases commonly used by customers were highlighted by the analytics program, allowing the bank to identify calls requiring longer handling times and repeated calls from the same person, as well as specific patterns in customer interactions. Identifying these key phrases enabled DBS to better address customer needs and preempt their complaints. For example, from the key phrases "cancel credit card" and "annual fee," DBS deduced that customers tended to call in to cancel credit cards when they were told they had to pay an annual fee.

> *"We would never know that by sending out a (request for payment of) membership fee, it is creating calls to come in, and customers start to evaluate about whether they should keep a card. It may not necessarily mean that we do not send out any more (requests for payment of) membership fees, but it means that we need to actively engage our customers prior to the fee being levied, to engage them to use our card more often so they automatically qualify for a waiver."*[31] Lena Low, Head of Customer Call Centre, DBS

29 DBS received the "Most Innovative Use of IT' award in the 2014 Singapore National Infocomm Awards.

30 "Banking's Technology Challenge," *The Business Times*, May 29, 2013, pp. 28-30.

31 Kwok, J. "DBS Call Center Finds Ways To Please Customers," *The Straits Times*, August 23, 2012.

As a result of such proactive interventions, DBS' customer relationships improved, as evident by the 45% rise in compliments and 17% decline in complaints compared to the previous year. Furthermore, the time required to meet each user request fell by 5%, which saved the bank about 107,000 staff hours a year.

To reimagine how banking services could be offered to its customers in the digitally enabled context, DBS actively incorporated human-centered design thinking into its customer analysis efforts. 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.

> *"... 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 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 are they concerned about, and then try and improve that process so their journey is more joyful."*[32] Neal Cross, Chief Innovation Officer, DBS

For example, after observing that its customers spent a total of 15,000 hours a month at ATMs viewing account balances, DBS launched an SMS-based banking service in 2014 so that customers could carry out basic transactions, including checking balances, paying card bills and transferring funds to their own accounts. For the convenience of its customers, DBS also added alternative banking touchpoints as more transactions occurred outside traditional bank branches—e.g., through self-service kiosks and digital partnerships (e.g., with Guardian Pharmacies, Sheng Siong supermarkets, 7-Eleven stores and SingPost outlets).

Similarly, the design of DBS' new branch model showcased the intuitive integration of digital technologies for 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 within 15 minutes. In particular, the specially designed Consultation Pods (workstations) used technology to enable the bank's staff to focus on the customer:

> *"What we've built into these pods is enough technology so 95% of the interaction can be done without the [staff member] 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."*[33] 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."*[34] Neal Cross, Chief Innovation Officer, DBS

In early 2015, DBS was the first bank in Singapore to introduce an SMS 'Q' service, where customers could obtain a queue number and the estimated wait time via SMS prior to a branch visit. As this freed up customers' time, they became more amenable to speaking with staff, resulting in double-digit sales growth for bancassurance[35] and investment products at the branches.[36]

4. Incubate and Accelerate Emerging Digital Innovations

In 2010, DBS established an Innovation Council chaired by the CEO to provide a

32 Paperny, D. *Agile startups know their customers: DBS Chief Innovation Officer, Neal Cross,* Future & Innovation Series, February 18, 2015, available at http://futureseries.co/agile-startups-know-their-customers-dbs-chief-innovation-officer-neal-cross/.

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

34 Cross, N. "What's Your Definition of 'Digital' in Banking?," *The Financial Brand*, July 22, 2014.

35 Bancassurance is an arrangement in which a bank and an insurance company form a partnership so that the insurance company can sell its products to the bank's client base.

36 Boon, R. "Need for banks to boost tech to engage clients," *The Straits Times,* March 27, 2015.

dedicated focus on leveraging the digital edge for reinventing itself. A Chief Innovation Officer was head-hunted to lead a new Innovation Office, coordinate the various innovation efforts in DBS and standardize on a common methodology or language for innovation. The Chief Innovation Officer also reported to the Head of Group T&O to ensure that experimentation and the incubation of innovative ideas would leverage new digital possibilities and align well with current digital initiatives.

To foster greater innovations internally, several human resource initiatives were initiated, including innovation training workshops for staff, and profiling and recruiting people with strong "innovation potential" (for example, based on ideation competence, future-orientation). Examples of successful innovations were compiled and circulated throughout DBS as a way of boosting employees' confidence in putting forward innovation ideas. "Being innovative" and "a catalyst for change" also became key criteria for being considered for promotion.

DBS also began crowdsourcing innovative ideas from its employees. For example, uGOiGO™ was an online time deposit group-buy campaign started by a group of employees at DBS Hong Kong in 2013. The campaign targeted affluent customers using social media. More attractive tiered interest rates for time deposits were triggered once the deposit amounts hit specific targets. The new product launch was a tremendous success. The uGOiGO microsite generated over 64,000 page views, and acquisition of new customers by DBS Treasures (the bank's wealth management arm) grew 147 times more compared to the traditional means of customer acquisition. Total new deposits exceeded the original goal by 80%, with many of the customers being 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.

Innovative ideas were also sought internally at the strategic level. Specifically, the Innovation Council identified areas with high-disruptive potential for systematic incubation. Mobile banking and digital payment, along with analytics, SME banking, wealth management and others, were areas of strategic focus for digital innovation. DBS' key markets in Singapore and Hong Kong had high smartphone penetration and were excellent test-beds for the suite of 19 mobile apps that the bank had developed. These apps provided customers with more features for share trading, insurance purchase, home search, virtual credit card payment and mobile point-of-sale.

Notably, DBS PayLah!—a mobile wallet for peer-to-peer fund transfers among DBS account holders via smartphones—was a strategic response to the emergence of mobile peer-to-peer payment services that sought to cut out the banks' role as middlemen in payment services. Launched in 2014, DBS PayLah! attracted over 5,000 users within a week, making it the top finance app in the Singapore iTunes store. Users grew to 200,000 in six months.

DBS' mobile banking platform also grew exponentially, from 225,000 users when it was launched in 2010 to 1 million users in 2014. By 2014, the number of transactions made via the Internet and mobile apps each month had reached over 24 million and 11 million, respectively.[37] DBS' mobile apps strategy was named as the world's best in 2013-2014 by Swiss Research firm MyPrivateBanking.

As well as developing these creative solutions internally, DBS also sought external partnerships in developing its innovation ecosystem.

> *"We don't have all the smart ideas as we start to evolve our thinking about what banking is. This idea of outreach [helps us] to figure out what's going on in the world, brings smart ideas into the company, [which we use] to change the way people are thinking about banking inside the organization. [We get] some really great ideas that we can leverage. It is really starting to give us some huge momentum in DBS."* David Gledhill, Head of Group T&O, DBS

By working with established research institutions (e.g., universities) and technology partners (e.g., SAS, IBM Watson), DBS sought to harness external expertise and know-how to accelerate the rate of its digital innovation. For example, DBS exploited big data through IBM's Watson cognitive computing technology, which was deployed in its Wealth Management Division

37 DBS Annual Report, 2014.

and subsequently rolled out to other business lines. The Watson Engagement Advisor solution used artificial intelligence to glean insights on market research and transactional behaviors in guiding relationship managers to offer advice tailored to a client's risk appetite and desirable investment portfolio. Another collaboration was with Singapore's A*STAR Institute for Infocomm Research, which has over 600 scientists and engineers, to further develop the bank's analytics capabilities so it could deepen its understanding of customer "footprints" and thus provide more personalized interactions.

In addition, DBS cast the net wide for innovation ideas by actively engaging the tech start-up community through accelerator programs such as Startupbootcamp FinTech.

> *"The DBS hackathon is now a regular part of the DBS training curriculum; we were looking to break the stereotypes that define banks. We wanted to revolutionize the way we trained our people so that they would embrace a digital mindset. We sought to foster a cultural exchange between our employees and startups. We created a "sandbox" for our people to experiment like startups, to identify and act on opportunities quickly."* Neal Cross, Chief Innovation Officer, DBS

Referring to DBS' willingness to experiment and its "fail fast, learn fast" innovation philosophy, Neal Cross 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 into action.*"[38]

DBS saw such experimentations as a way of getting itself ready for the future—i.e., of catching a glimpse on how future banking models might look and building the bank's readiness to respond to such disruptions if necessary. An example of an innovative banking model is BBVA, a large Spanish bank, which has begun to expose its key banking services to outsiders to encourage others to develop innovative banking apps. BBVA's aim is to become a banking industry platform player (i.e., to provide the architectural platform for banking apps).[39] In the same way, DBS had developed about 150 different APIs (application programming interfaces) that were ready to be opened up to developers of new banking apps. It was building a new digital front end that would connect to about 20 different ecosystem partners so those partners could build products on top of DBS' existing banking platform.

Benefits Gained from DBS Bank's Digital Business Strategy

The substantial investment in technology as a foundation for growth appeared to have paid off for DBS. In 2014, the bank delivered its 22nd consecutive quarter of year-on-year growth, and its income and earnings reached a record S$9.62 billion and S$4.05 billion respectively, with net profit crossing the S$4 billion mark for the first time. DBS' share price also rose from S$11.48 during the financial crisis in 2009 to a high of S$20.60 in 2014.[40] In addition, the stable growth enabled by the robust technology infrastructure has led to DBS being recognized as one of the world's strongest[41] and best-capitalized banks, with "AA-" and "Aa1" credit ratings that were among the highest in Asia-Pacific. It had also received a range of accolades, including being named "Safest Bank in Asia" for six consecutive years to 2014, the "Best Bank in Asia-Pacific" and the most valuable bank brand in ASEAN.[42] In 2014, DBS was ranked Asia's third-largest trade finance bank by market share, after global banks HSBC and Citigroup.[43] Additionally, DBS was the only Asian bank among the top 10 private banks

38 Wheatcroft, C. "Digital is a spectrum - at one end it's about improving presence but at the other it's reinvention," *The Asian Banker*, February 24, 2015, available at http://www.theasianbanker.com/updates-and-articles/%E2%80%9Cdigital-is-a-spectrum-at-one-end-it%E2%80%99s-about-improving-presence-but-at-the-other-it%E2%80%99s-reinvention%E2%80%9D.

39 BBVA has made its API available through its BBVA Developer Center site, available at https://developers.bbva.com/web/bbva-open-platform/home.

40 DBS Annual Report, 2014.

41 DBS was ranked the 7th strongest bank globally in 2014 by Bloomberg.

42 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.

43 McCabe, T. *Asia Transaction Banking Delivering Sustainable Returns*, DBS, March 27, 2014, available at https://www.dbs.com/iwov-resources/pdf/investor/other-materials/2014/2014-0327_GTSpresentationupdate.pdf.

in Asia, in an industry dominated by global wealth managers including UBS, Citigroup and Credit Suisse.[44]

Key Lessons Learned from Pursuing a Digital Business Strategy

The DBS case describes its digital transformation in response to rising demands of digitally savvy customers and the threats of fintech disruptions. Led by its visionary CEO, DBS invested heavily in technology as a competitive enabler and successfully undertook radical organizational changes to "rewire" the entire enterprise for digital innovation. The case shows how, over the course of its transformation, DBS gradually built up the necessary capabilities to pursue a successful digital business strategy: cultivating the leadership for digital transformation, developing agile and scalable digital operations, designing new digitally enabled customer experiences, and incubating and accelerating emerging digital innovations. These capabilities dynamically complemented each other, with the new digital leadership providing both the impetus to transform and the resolve to develop the enterprise digital platforms on which new digitally enabled customer experiences were designed. At the same time, new innovation capabilities were gradually developed through strategic incubation, technology partnering and mindset change.

The building of each capability was not a one-time initiative but required a full organizational approach to "rewire" the related structure, process, technology and people elements (see Table 1). Changes to the structure, for example, were radical because they needed new senior executives to be appointed, departments to be merged, strategic external talents to be hired and changes to formal reporting relationships. In fact, the convergence of various reporting lines says a lot about the strategic emphasis DBS placed on the role of digital innovation. The line of business T&O, country T&O, process transformation, customer experience and innovation were brought together under the Head of Group T&O, and ultimately under the CEO (see Figure 2 earlier). Similarly, new processes needed to be institutionalized and supported with the relevant technology to ensure the changes were implemented enterprise wide. The hardest capability to build was the mindset change needed. This was the area that DBS spent the most time and effort developing.

Drawing from the transformation experience of DBS, we have identified four key lessons for organizations aspiring to pursue a digital business strategy.

1. A Digital Business Strategy Demands Strong Leadership

DBS' journey suggests that the pursuit of a digital business strategy is not a project, nor the job or responsibility of a specific "digital" department or IT division, but is a core belief that needs to pervade the entire enterprise. Specifically, the senior leadership in DBS and the management structure put in place played a key role in creating the digital mindset that is a prerequisite for fusing business and technology strategies. This was evident in the deep commitment of the visionary CEO, the inclusion of the Head of Group T&O as a key member of the central executive committee, and a team of transformed senior business executives who are now "digital warriors" championing digital innovation in their respective business domains. The convergence of various reporting lines was also crucial in that it allowed the underlying tensions between exploring and exploiting to surface and be dealt with at the strategic level—an ambidextrous skill that leaders driving digital transformation must develop.

2. An Agile and Scalable "Core" Is Critical

DBS' digital transformation journey highlights the importance of building an agile and scalable digital infrastructure. Such an infrastructure enables organizations to capture the value of digitalization. DBS invested heavily and continuously to build a modular and agile technology infrastructure that enables subsequent scalability of new initiatives (e.g., a configurable core banking system, online/mobile banking platforms, straight-through processing, service-oriented architecture, data centers). The ability to digitize best practices and quickly

44 Vallikappen, S. "UBS Retains Top Spot Among Wealth Managers in Asia," *Bloomberg*, October 17, 2014.

Table 1: Digital Capabilities and the Related Organizational Elements

	Cultivating Leadership for Digital Transformation	Developing Agile and Scalable Digital Operations	Designing New Digitally Enabled Customer Experiences	Incubating and Accelerating Emerging Digital Innovations
Structure	• Visionary CEO • CIO in senior executive team and reporting to CEO • Convergence of reporting to CIO	• Newly merged technology and operations (T&O) • Structural T&O alignment to business divisions and geographical markets • New head of process transformation • Process transformation office	• New head of customer experience • Customer experience council • Customer experience office	• New head of innovation • Innovation council • Innovation office
Process	• IT investment prioritization • Enterprise governance and coordination • Technology roadmapping workshops	• Process streamlining, rationalization, consolidation, improvement • Enterprise architecting • Technology integration competency development	• Development and diffusion of customer service framework • Human-centered design • Customer journey lab	• New training, recruitment, assessment, promotion • Strategic incubation, internal crowdsourcing, hackathons • Technology partnering and start-up collaboration
Technology	• Unified communication platform • Enterprise portal • Collaborative platform	• Internet banking • Mobile banking • Configurable core banking system • Modernized legacy systems • Enterprise application integration (EAI) technologies	• New branch model • Call centers with voice analytics • Data-drive ncustomer analytics	• Emerging technologies (e.g., mobile, payment, analytics, social media) • Disruptive fintech technologies (e.g., crowdfunding, P2P lending, social trading)
People	• Digital thinking among business executives, moving from "tech-idiots" to "digital warriors"	• Continuous process improvement, and lean thinking	• Customer service mindset (RED) focusing on total customer experience	• Innovative, inventive entrepreneurial start-up-like thinking

deploy them enabled DBS to respond swiftly to changing and new customer needs. The robust digital platforms also provided the basis for subsequent connections to new or innovative apps through plug-and-play linkages using APIs and web services. The ability to rapidly scale up and down its digital infrastructure was a strategic capability that contributed to the success of 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 digitizing the bank. Less than 10% of it is in the front end apps; 90% of it is in digitizing the middle and the back. How do you digitize the back end and create middleware around it that allows seamless connectors and connectivity into the front end?"*[45] Piyush Gupta, CEO, DBS

45 Tan, N. "Singapore well-poised to build vibrant FinTech sector: Industry Players," *Channel News Asia*, May 6, 2015, available at http://www.channelnewsasia.com/news/business/singapore/singapore-well-poised-to/1829460.html.

As noted by DBS' Head of Group T&O, the real value of T&O was its strong competency in technology integration, which helped in devising sound business solutions on top of the core architecture. These solutions were needed to enable DBS to respond to dynamic business demands and new digital innovations.

3. A Digital Business Strategy Exploits Information Abundance to Create New Value for Customers

The pursuit of a digital business strategy requires organizations to strategically leverage their increasing abundance of digital information. DBS actively directed the exploitation of data from its digital platforms to create new customer experiences. Its focus on customers was strong.

> *"I am very passionate that we forget about the fact that we have products and services to sell, and instead focus on what the customers are trying to achieve in their lives and then see how we can integrate that with financial services."* Neal Cross, Chief Innovation Officer, DBS

The continuous focus on customer needs and the related data analysis led to some long-held customer assumptions being rejected. For example, DBS found that wealthy Asian clients were more digitally savvy than in other parts of the world, preferring digital contact over direct contact. As noted by the Chief Innovation Officer, "*For a long time, there was a belief in the market that billionaires would be less tech savvy than affluent clients, which has proven [to be] totally wrong*." This realization led to DBS launching a digital wealth management platform for its customers.

4. A Digital Business Strategy Requires the Continuous Navigation of the Dynamic and Emerging Digital Landscape

The dynamic responses of DBS as it responded to the various sources of digital disruptions highlight the need for continuous navigation of the dynamic digital landscape. Non-traditional players encroaching into the banking space in Asia include PayPal, WeBank (backed by Chinese social media company Tencent) and Alipay (Alibaba's third-party online payment service). Alipay's online investment fund, Yu'E Bao, for example, attracted US$92 billion in deposits from over 100 million users, making it the world's fourth-largest money market fund in its first year of operation.[46]

Weill and Woerner have highlighted the need for banks to search for new sources of value in the emerging digital ecosystem.[47] If they don't, say Weill and Woerner, they risk being relegated to mere providers of highly regulated, back-end transaction processing and commoditized services, and their customers will increasingly look to companies such as Apple, Google or Alibaba to meet their financial needs. Although that extreme scenario is possible, there is not yet any clear sign of who will emerge as the winners and losers in the digital shake-up of the financial industry. Hence, navigating the dynamic digital banking innovation landscape to find new sources of value is certainly no easy task.

But the uncertainty did not stop DBS from its various efforts in experimenting with new banking models (e.g., internal crowdsourcing of ideas, customer experience labs, hackathons, external partnering, nurturing of fintech startups).

> *"I am looking for things to power the digital bank as we build it up in the region. What innovation can we bring to that? I hope to find startups that can plug into that strategy."* Neal Cross, Chief Innovation Officer, DBS

Technology scanning and experimentation were necessary to better prepare DBS for dealing with the digital disruptions that fintech developments might bring. These explorations essentially created strategic options for the future so that DBS would be able to adapt dynamically when the opportunities or threats arose. DBS Paylah!, for example, was a strategic response to the emergence of mobile peer-to-peer payment services that sought to cut out banks as the middlemen.

46 *Aligning the Financial Systems in the Asia Pacific Region to Sustainable Development*, United Nations Environment Programme, 2014, available at http://www.switch-asia.eu/fileadmin/user_upload/Publications/2015/Unep-Inquiry_Asia_Finance_Final.pdf.

47 Weill, P. and Woerner, S. L. "Thriving in an Increasingly Digital Ecosystem," *MIT Sloan Management Review* (56:4), 2015, pp. 26-35.

At the same time, by assessing such potential threats, DBS gained greater clarity about its unique strengths and resources (e.g., financial strength, skills and knowledge, brand equity, banking network, technology platforms and its Asian heritage) that would position itself well vis-à-vis potential disruptors.

> *"There's nothing that a tech company can do that I can't, and I can do things they can't. Banks have innate advantages that others don't, such as banking expertise, robust networks and infrastructure, and established risk management frameworks, to name a few. None of the fintechs, for instance, has fully integrated access to a market trading platform. If we can marry these strengths with the agility, customer-centricity and inventiveness of fintech, there is no reason we cannot carve out a befitting space for ourselves in the new world order."*
> Piyush Gupta, CEO, DBS

Hence, organizations aspiring to pursue a digital business strategy need to be prepared to continuously navigate the dynamic and emerging digital landscape. They need to assess how quickly and on what scale disruptive innovations are likely to occur, and devise strategic responses to cope with dynamic shifts. This requires the willingness to experiment and explore new digital frontiers to create strategic options for the future. It also requires subjecting the organization to strategic (but uncomfortable) conversations to clarify its core competencies and unique assets.

However, a digital business strategy cannot be conceived independently of the business ecosystem the organization is in. In the banking sector, organizations need to develop clarity about the new sources of value creation in the banking ecosystem and find ways to capture that value. Thus, banks need to ask themselves:

- Which parts of the business should we keep in-house and at the forefront of innovation (e.g., P2P payment as in DBS Paylah!)?
- Which parts should we collaborate with strategic partners on (e.g., DBS' collaboration with IBM Watson for data analytics)?
- Which parts should we seek to acquire new capabilities for (e.g., DBS' participation in the community of fintech startups)?
- Which part should we strategically lag as a late adopter (e.g., uncertain developments in bitcoins).

Concluding Comments

DBS' digital transformation journey highlights the key capabilities that an organization needs to build so it can pursue a digital business strategy. For many organizations, pursuing such a strategy is now a business imperative because the threats and opportunities from digital disruptions are fast becoming a reality. Hence, there is greater urgency to "rewire" or transform traditional enterprises so they can accommodate digital innovation. Senior executives must ask themselves these questions:

1. To what extent does the organization have the required digital capabilities to counter the threats or exploit the opportunities from digital disruptions?
   - To what extent have the leadership skills required for digital transformation been cultivated among the senior executives?
   - To what extent has the organization developed agile and scalable digital operations to respond to the dynamism of the digital era?
   - To what extent has the organization leveraged its abundance of data to design new digitally enabled customer experiences?
   - To what extent has the organization accelerated the pace of innovation and incubated emerging digital innovations?
2. What can the organization do to develop its digital capabilities further by overhauling the related elements in structure, process, technology and people?

Given the state of flux in the digital landscape and the related competitive dynamics, definitive answers to these questions are far from obvious. However, initiating the process of seeking

answers is a sensible first step in the pursuit of a digital business strategy. Adopting the lessons gained from DBS' experiences should mean that the journey of digital transformation will be as rewarding as the strategic outcomes achieved at the end.

Appendix: Research Methodology

We conducted an intensive case study of DBS' digital transformation journey, focusing on how it perceived threats and opportunities of digital disruptions and how it built up the required capabilities to aggressively pursue its digital business strategy. In addition to news articles, annual reports, published statements on its websites, presentation slides and videos, we interviewed senior business and technology executives in DBS who were actively involved in the transformation. A total of 12 interviews were conducted from late 2011 to early 2015.

About the Authors

Siew Kien Sia

Siew Kien Sia (asksia@ntu.edu.sg) is Director of the Information Management Research Centre (IMARC) and Associate Professor of Information Systems at the Nanyang Business School, Nanyang Technological University, Singapore. His main research interests are in process redesign, enterprise systems, enterprise integration, complex organization design and the development of digital capabilities. He has over 20 years of research and consulting experience in private- and public-sector organizations and has published widely in international journals, such as *MIS Quarterly, Journal of MIS, Journal of AIS, Decision Sciences, Communications of the ACM* and *MIS Quarterly Executive*.

Christina Soh

Christina Soh (acsoh@ntu.edu.sg) is a professor and head of the Division of IT and Operations Management at the Nanyang Business School, Nanyang Technological University. She received her Ph.D. from the Anderson Graduate School of Management, University of California, Los Angeles. Her areas of research include the management of IT resources in global enterprises, strategy and technology innovation, the management of complex, enterprise-wide IT projects, and electronic marketplaces. Her research has been published in top IT management journals, including *MIS Quarterly, MIS Quarterly Executive, Communications of the ACM, European Journal of Information Systems, Journal of Strategic Information Systems* and *Journal of Information Technology*. She is a senior editor at the J*ournal of Strategic Information Systems* and is on the editorial board of *Information and Organization*.

Peter Weill

Peter Weill (pweill@mit.edu) is Chairman, MIT Sloan Center for Information Systems Research (CISR) and Senior Research Scientist at MIT Sloan School of Management. He researches the role, value and governance of digitalization. He is a popular presenter to executive audiences and has published widely, including award-winning books, case studies and journal articles. His work has appeared in *Harvard Business Review, Sloan Management Review* and *The Wall Street Journal*. Weill has co-authored five books published by Harvard Business School Press, including his latest book, *IT Savvy: What top executives must know to go from pain to gain*. In 2008, Ziff-Davis and eWEEK.com recognized him as No. 24 in the "Top 100 Most Influential People in IT" and as the highest-ranking academic.