DBS: FROM THE "WORLD'S BEST BANK" TO BUILDING THE FUTURE-READY ENTERPRISE

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MARCH 2019 | CISR WP NO. 436 | 20 PAGES

CASE STUDY

an in-depth description of a firm's approach to an IT management issue (intended for MBA and executive education)

DIGITAL TRANSFORMTATION

DISRUPTIVE INNOVATION

FUTURE OF BANKING

The case presents the second phase of DBS Bank's digital transformation. Upon completing the first phase of the transformation (2009–2014) that radically "rewired" the entire enterprise for digital innovation, DBS initiated its second digital push in 2015 to address ever-emerging threats from fintech companies and institutional constraints on acquisition-led organic expansion. To DBS, this digital transformation was an ongoing journey in building a next-generation enterprise. It centered on developing the core capabilities to be ready for a digital future by becoming digital to the core, embedding banking in customer journey, and creating a 26,000-person start-up.

MIT MANAGEMENT SLOAN SCHOOL | CENTER FOR INFORMATION SYSTEMS RESEARCH (CISR)

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DBS: FROM THE "WORLD'S BEST BANK" TO BUILDING THE FUTURE-READY ENTERPRISE

From 2016 to 2018, DBS was most favored by investors. The share price of Southeast Asia's largest bank by assets roughly doubled during that period, with gains outstripping those of its main local rivals.[1] The market's optimism about DBS was partially attributed to the bank's digital prowess. *Euromoney*, a finance magazine, awarded DBS the World's Best Digital Bank in 2016 and again in 2018. It lauded DBS as "an institution in which every part of the business—from cash management to private banking, from small-to-medium enterprises (SMEs) to retail—is being enriched by a challenging process of willful digital disruption."[2] In August 2018, DBS received yet another prominent award: it was named by *Global Finance* magazine as the Best Bank in the World. The magazine profiled DBS as a financial institution that was "pointing the way to the future for the entire industry with its digital transformation, strong financials, and good corporate citizenship."[3]

DBS, a commercial bank headquartered and listed in Singapore, provided a full range of services in consumer, SME, and corporate banking. It operated over 280 branches across 18 markets, with a growing presence in the three principal Asian axes of growth: Greater China, Southeast Asia,

1 "How digitisation is paying for DBS," *The Economist*, March 28, 2018, https://www.economist.com/finance-and-economics/2018/03/08/how-digitisation-is-paying-for-dbs.

2 "World's best digital bank 2018: DBS," *Euromoney*, July 11, 2018, https://www.euromoney.com/article/b18k8wtzv7v23d/world39s-best-digital-bank-2018-dbs.

3 "DBS named best bank in the world," DBS Newsroom, August 24, 2018, https://www.dbs.com/newsroom/DBS_named_Best_Bank_in_the_World.

This case study was prepared by Sia Siew Kien of Nanyang Business School, Peter Weill of the MIT Sloan Center for Information Systems Research, and Mou Xu of Nanyang Business School based on interviews with DBS Bank. The case is intended for class discussion and learning, and not intended as source research material, or as illustration of effective or ineffective management. The case study was originally published in December 2018 by The Asian Business Case Centre, Nanyang Business School, Nanyang Technological University, Singapore.

and South Asia. In 2017, the bank achieved a record net profit of SGD 4.39 billion, and its total income rose 4 percent from the previous year to a new high of SGD 11.9 billion.[4]

The bank initiated its digital strategy in 2009 under the relentless push of new CEO Piyush Gupta. Between 2009 and 2014, DBS invested heavily in technology and undertook radical changes to "rewire" the entire enterprise for digital innovation. Key thrusts of its digital transformation involved revamping its Technology and Operations organization, developing scalable digital platforms, leveraging on technology to redesign its customer experience, and fostering internal incubation as well as external partnerships for digital innovation.[5] David Gledhill, the chief information officer (CIO) of DBS Bank, noted that these were foundational years that set the stage for its next phase of growth. In the first phase of its transformation, DBS achieved a 9 percent compound annual growth rate (CAGR) in income and 13 percent CAGR in net profit.

However, threats posed by financial technology ("fintech") disruption were relentless, with many fintech start-ups emerging and offering a wide range of innovative financial products and services.

Last year we had about 12,000 new [fintech start-ups] enter the market space, and they came in with private equity of around USD 31 billion. Even if 1 percent survives, that's 120 new people that you have to contend with. They are literally attacking any and every area and space where we have a service proposition. The key tipping point was when the large tech companies decided to jump into the space as well.

BIDYUT DUMRA, HEAD OF INNOVATION

A case in point was the Chinese e-commerce giant Alibaba. It had been expanding in the region with a controlling stake in Singapore-based Lazada, the top e-commerce player in Southeast Asia. Alibaba affiliate Ant Financial merged Lazada's HelloPay with its flagship Alipay payment platform. Alibaba also led a USD$1.1 billion investment round in Tokopedia, a major e-commerce platform in Indonesia, last year.[6] Similarly, Grab, Southeast Asia's leading ride-hailing company, also began promoting GrabPay, a mobile e-wallet that could be linked to customers' credit and debit cards. Moreover, the competition was even coming from non-tech incumbents that had a large consumer base and strong branding, such as budget airline AirAsia.

At the same time, DBS also faced growing institutional constraints for organic expansion and acquisition-led growth in the region, specifically in the emerging Southeast Asia and South Asia markets. The advent of fintech, however, opened up new possibilities. Instead of building banks the traditional way, DBS saw opportunities in driving technology-led growth in these emerging markets.

In 2015, DBS embarked on the second phase of its digital transformation, with a renewed mission to leverage technology to "Make Banking Joyful." "Live More, Bank Less," DBS's latest manifesto, captured this new vision of simple, effortless banking for its customers. Support from the bank's board was strong, with an annual technology budget commitment of USD$600 million. The bank's ambitious digital transformation was grounded on three fundamental "philosophical shifts" to reinvent DBS by becoming digital to the core, embedding DBS in the customer journey, and creating a 26,000-person start-up.

BECOMING DIGITAL TO THE CORE: DBS'S GANDALF TRANSFORMATION

To compete effectively, DBS had to overhaul its existing technological paradigm to become digital to the core. It wanted to engineer deep into its core tech infrastructure to be like the tech giants, among the likes of Google, Amazon, Netflix, Apple, LinkedIn, and Facebook. DBS aspired to be the D in the GANDALF technology transformation.

4 "DBS full-year 2017 net profit rises 4% to record SGD 4.39 billion," DBS Newsroom, February 8, 2018, https://www.dbs.com/newsroom/DBS_full_year_2017_net_profit_rises_4pct_to_record_SGD_4_39_billion.

5 Sia S.K., C. Soh, P. Weill, and Y. Chong, "Rewiring the Enterprise for Digital Innovation: The Case of DBS Bank," Asian Business Case Centre (2015), Ref. ABCC-2005-004.

6 "Alibaba Is Expanding Its E-Commerce Platform Into These 4 Markets," Leo Sun, The Motley Fool, September 1, 2018, https://www.fool.com/investing/2018/09/01/alibaba-is-expanding-its-e-commerce-platform-into.aspx.

GANDALF might sound a little cheesy, but in fact, it was an amazing rallying call to our people. It had a bigger impact on our people than anything else we have done, because it started to make them think about what was possible. It was an immediate culture pivot to shock people to think differently, like a lightning rod. Many of us have built our whole careers by doing things the old way. All of a sudden, we were told, that's different now. For a bunch of incumbents, how do you stop and make the fundamental shift? GANDALF was really what broke the glass [ceiling] for us and enabled us to describe a different way of running the company without having to excuse the past. We never excuse the past. We always said that got us to this point here, [but] that's not going to move us forward.

DAVID GLEDHILL, CHIEF INFORMATION OFFICER

DBS conducted a comprehensive diagnosis of its technological competencies, infrastructure, and emerging technology trends. A team in DBS also visited some of the world's foremost technology companies to glean valuable insights and learn how to implement industry-leading best practices in the bank.

We started to learn how the best technology organizations operate, how they engineer systems, how they think about customer experience, how they think about experimentation, how they move quickly… We also learned about their culture and which cultural elements we could take on board… The biggest aha moment for me was that none of these companies started out engineering things the way they ought to be. Not one. In fact, they all started out looking a lot like we looked… They had big legacy systems, they had monoliths, and they weren't scalable. They couldn't move fast, and [so, they] had to change. Legacy debt, same story. If they could do it, so could we.

DAVID GLEDHILL

A strategic decision was made to bring DBS's tech infrastructure team in house to run its own tech, and to go from 85 percent outsourcing to 85 percent insourcing. According to Gledhill, "We just had to run our own tech, otherwise we'd never have our own tech DNA." The insights learned from the experiences of the tech giants were synthesized into the GANDALF Transformation Cheese Wheel (see figure 1). The five elements became DBS's technology mission to build its delivery pipeline for scalability, speed to market, and continuous innovation to be on par with prominent technology companies.

The first element, "Design for Modern Systems," was a call to engineer technologies and build systems that are scalable, elastic, and ready for experimentation. There was a huge push for virtualization as servers were decommissioned and data centers were shrunk. Legacy applications were gradually moved into modern hardware and refactored.[7] DBS instituted a policy of "everything goes cloud[8]" and systematically sequenced its application migration[9] from being cloud-ready to cloud-optimized, and eventually, cloud-native. It also partnered with Amazon Web Services to train its employees in cloud engineering. For new applications, architectural screening checks (through questions such as, "can it function in the cloud?" "can it work as a micro-service?" and "is it API-ready?") ensured that DBS did not invest in technologies that would "get DBS stuck in the future."

Going digital means a much faster speed of change. How should we change our technology to support the dynamism? Google, LinkedIn, Facebook have all faced this problem. We learn from them. For example, they don't buy expensive super-big hardware. They buy commodity hardware and design their apps to operate across multiple hardware. They use software to define infrastructural requirements and

7 Code refactoring is the process of restructuring existing computer code without changing its functionality and external behavior.

8 The "cloud" refers to a network of remote servers hosted on the internet, rather than on a local server or a personal computer, to store, manage, and process data.

9 Application migration is the process of moving an application program from one environment to another—for instance, from a local server to the cloud.

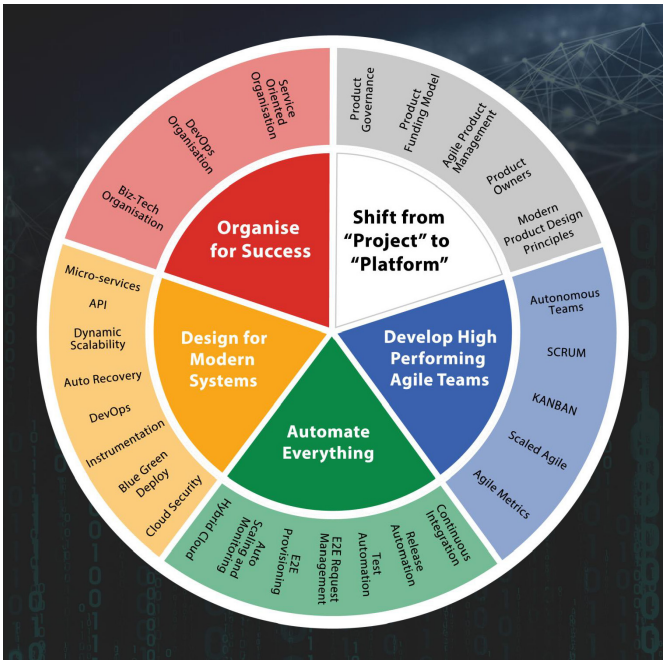
automate all setups through scripting to address the people scalability problem. The hardware stack, the software stack, the way we operate, and the alignment of accountability must all be changed.

TAN CHOON BOON, HEAD OF PLATFORM, STRATEGY, AND ENGINEERING

These changes were encapsulated in the other four elements of the GANDALF Transformation Cheese Wheel:

- **Automate Everything** (i.e., by designing for NoOps[10] through automation tools to manage technology assets, and by optimizing the DevOps[11] pipeline from testing to deployment to increase cadence[12])
- **Develop High Performing Agile Teams**[13] (i.e., by changing the way technology teams work, through the adoption of agile methodology[14])
- **Organize for Success** (i.e., by reorganizing infrastructure engineering to be more service-oriented, pushing DevOps integration by removing the traditional separation between development and operations, and strengthening the alignment of business and technology units)
- **Shift from "Project" to "Platform"** (i.e., by shifting from funding individual projects that need approvals or subcommittee reviews to give the freedom to a group of people who jointly operate and manage key technology platforms)

Figure 1: GANDALF Transformation Cheese Wheel



Source: DBS

10 NoOps (no operations) refers to the concept that an IT environment can become so automated and abstracted from the underlying infrastructure that there is no need for a dedicated team to manage software in house.

11 DevOps refers to a software development methodology that combines software development with information technology operations. The objective of DevOps is to shorten the systems development life cycle while also delivering features, fixes, and updates frequently in close alignment with business objectives.

12 In software development, cadence refers to the speed of code integration and testing, as well as how quickly software development efforts are able to respond to business and customer needs.

13 An agile team is a cross-functional group of people that self-organize and collaborate with each other to produce working, tested solutions.

14 For more information on the Agile Method, see "A Beginners Guide To Understanding The Agile Method," one the Linchpin SEO website, https://linchpinseo.com/the-agile-method/.

One key thrust of the GANDALF Transformation was the concept of a technology platform (much like a product platform[15] usually found in tech companies).

Up till now, we have been running DBS as a business with technology supporting the business. The mandate for tech was that the business had a vision and an agenda, and tech would be supporting that vision and agenda. But as we entered the digital era, there was a stark realization that from a customer perspective, as far as they're concerned, we're one organization. So what we've decided is we will fuse the DNA of the business and IT into what we call "platforms," with the same groups of people being responsible for envisioning, designing, building, and deploying tech to customers. Instead of funding projects, we fund the platform. We look at what outcomes that platform can give and set it free. With that, we can really start to practice agile at scale.

BIDYUT DUMRA, HEAD OF INNOVATION

CIO David Gledhill had set some hard targets for DBS's technology infrastructure revamp, and the results were encouraging. For example, its technology infrastructure was successfully insourced into a 1,000-strong development center in Hyderabad, India. 100 percent of applications were on DevOps, 95 percent of its systems were virtualized, and 80 percent of applications had been moved to the cloud. DBS was able to cut its application costs by over 80 percent by the end of 2017. Its release cadence of new applications had increased by close to 10 times, thanks to pipeline automation for application development.[16]

EMBEDDING BANKING IN THE CUSTOMER JOURNEY: MAKING DBS INVISIBLE

DBS also took its deeply-ingrained customer journey philosophy (established in its first phase of transformation) to the next level by explicating the idea of making banking invisible, i.e., "We disappear but we still provide great service," which was ultimately captured in its "Live More, Bank Less" manifesto.

Time is precious, so we want to give it back to the customers. When we make the bank invisible and customers' journeys joyful by putting all their banking needs on their phones, they have a 24x7 bank in their palms. The whole intent is to remove tedious customer tasks around banking.

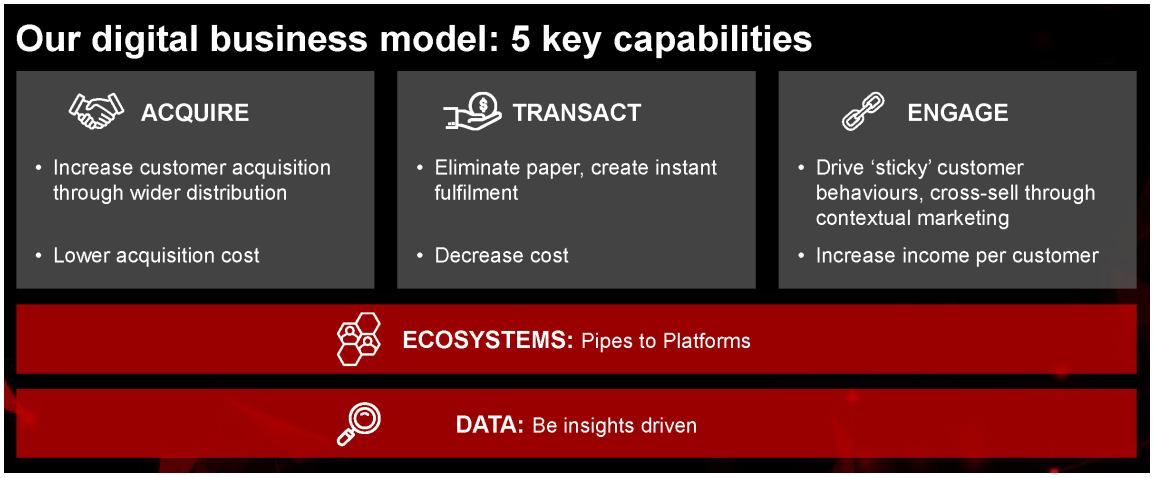
LEE YAN HONG, HEAD OF GROUP HUMAN RESOURCES

DBS's shift to a new digital business model was founded on five key capabilities (see figure 2).

15 A product platform is a set of common elements such as underlying technical components, parts or technologies that are shared across a range of a company's products.

16 "DBS Group Holdings Ltd Annual Report 2017," DBS, March 28, 2018, https://www.dbs.com/annualreports/2017/index.html.

Figure 2: Key Digital Capabilities



Source: DBS

Every organizational unit in DBS could apply these five capabilities to its respective domain as it digitalized:

1. **Acquire**—to increase customer acquisition through wider online distribution (e.g., moving away from customer acquisition through branches or relationship managers towards digital marketing, HR accessing new talent pools through social media and LinkedIn)
2. **Transact**—to eliminate paper and enable instant fulfilment (e.g., moving away from physical documents to e-documents such as consolidated e-statements, moving from manual account opening or trade execution to one-click straight-through processing or transaction automation)
3. **Engage**—to drive sticky customer behaviors and cross-sell through contextual marketing (e.g., personalized research reports served digitally, an HR-created multipurpose app that allowed employees to connect and get all the "information on the go, work on the go, and connect on the go")
4. **Ecosystems**—to enable the bank to embed its services in the customer journey, often by partnering external companies through APIs to deliver new customer value propositions

In the past, you had branches, you had call centers and ATMs. But in the future, the banks will not be owning all the channels. There will be hundreds and millions of other digital businesses popping up. The user will basically live their life with all the other digital ecosystem players without even thinking about where the banks are, or what each bank can offer. That's part of the reason why we wanted to be the kind of bank that can easily embed ourselves into the customer journey. Although we may not own all the platforms, we want to be where the customer is. That's where we can understand more about a customer's behavior, through the interaction and data that we gather through those channels. Also, this makes the whole experience enjoyable, so that customers will stay with us for a long time.

DANIEL LI, HEAD OF API PARTNERSHIPS

This ecosystem aspiration was enabled through DBS's API[17] platform. DBS began building open API platforms (a way for developers and DBS to access each other's applications seamlessly) in 2017. In November that year, it rolled out the world's largest API platform hosted by a bank, offering over 150 APIs across more than 20 service

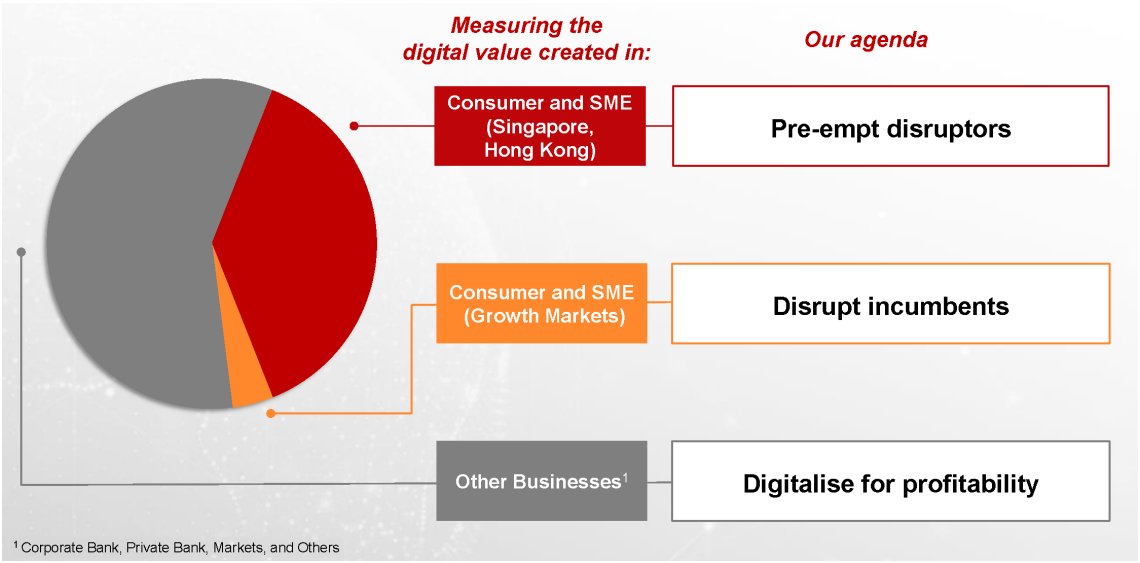
17 An Application Programming Interface (API) refers to a set of functions and procedures that allow the creation of applications that access the features or data of an operating system, service, or another application.

categories such as fund transfers and real-time payments.[18] Most of these APIs facilitated business services, such as credit card management, calculation of loan eligibility, redemption of loyalty points, and calculation of foreign exchange rates. More than 50 companies, including household names such as AIG, McDonald's, and foodpanda (a food delivery service) were already on the platform at the time of launch. Through these APIs, DBS customers could use PayLah!, a mobile wallet created by DBS, to pay for McDelivery; withdraw cash from neighborhood mini-marts (soCash); transfer fares earned by drivers on Grab's ridesharing platform directly to their bank accounts; and so on.

5. **Data—**to tap on data to gain customer and operational insights. For example, DBS's ATM team worked with data scientists to create predictive models for preventive maintenance and cash recycling that were based on insights gleaned with data analytics methodologies. This effort reduced ATM downtimes from 20 percent to a negligible level, saving the bank USD 20 million. Similarly, the bank's audit teams reaped considerable productivity gains by applying data analytics and machine learning to automate processes such as branch risk profiling, trading fraud analysis, and credit risk assessment. Other teams implemented data tools in management reporting. HR ventured beyond this, developing models to identify top traits of high performers and predict early attrition, and implemented their findings in the design of appropriate intervention programs.

These capabilities were deployed to drive different agendas in different markets (see figure 3). In the bank's core markets of Singapore and Hong Kong, DBS digitalized aggressively to preempt disruptors. In its emerging markets (e.g., India, Indonesia), DBS was the new entrant with innovative fintech solutions to disrupt local incumbents for growth. In all the other businesses (e.g., cash management, wealth management, audit), these capabilities were deployed to drive efficiency gains and improve profitability.

Figure 3: Digital Strategies



Source: DBS

EXPERIMENTING WITH MOBILE-ONLY BANK IN INDIA

In particular, the launch of digibank in April 2016, DBS's mobile-only bank in India, was a bold step towards experimentation with new banking concepts.

18 "Reimagining banking, DBS launches world's largest banking API developer platform," DBS, November 2, 2017, https://www.dbs.com/newsroom/Reimagining_banking_DBS_launches_worlds_largest_banking_API_developer_platform.

How do you build a mobile-only bank in India and attract customers at scale? No idea. We had to learn as we go, which means we had to iterate very fast. We were actually pushing out releases weekly in the app store. "Test and learn, test and learn, test and learn" was the only way we could get into a brand-new market with a product that we had simply no idea how it was going to operate when we launched it.

DAVID GLEDHILL, CHIEF INFORMATION OFFICER

Digibank was paperless, signature-less, and branchless. A customer's identity was verified using his/her Aadhaar card, India's national biometric ID. Customer service was delivered by an AI-driven virtual assistant that handled over 80 percent of all customer requests without human intervention.[19] Digibank required just a fifth of the resources of a traditional bank setup; it was thus able to compete aggressively by offering consumers higher interest rates and lower banking fees. Account-holders earned 7 percent interest from the first rupee, one of the highest in the market, and enjoyed unlimited no-fee cash withdrawals at over 200,000 ATMs nationwide.

DBS was executing a two-phase product rollout: savings, time deposits, and payment services in Phase 1. Phase 2, which offered unsecured loans, remittances, insurance, and credit cards would start from Q1 2018. The unsecured lending would use an algorithm-based model that assessed a borrower's creditworthiness with data analytics. DBS collaborated with credit analysis firms, telecommunications service providers, and other ecosystem partners to access and leverage on borrowers' basic details as well as their behavioral, social, and transactional data. In the SME market, DBS partnered with Tally, India's largest enterprise resource planning (ERP) software provider, to enable ERP-banking integration for seamless e-payments, and auto-reconciliation to enable faster cash flow for SME customers.

CHALLENGES IN BUILDING AN ECOSYSTEM PLATFORM

The shift towards a fully digital business model was not without its challenges. Building the API platform was particularly demanding, and DBS expended considerable efforts in bringing its business units (BUs) and external partners up to speed. Internally, explaining the API concept to the BUs took a while. Daniel Li, Head of API Partnerships, said, "An API is something that is very technical. The term itself is technical, so how do you communicate its business proposition? How do you educate the business sponsors and also the business units such that they would be able to look at this as a new opportunity?"

API governance was also an issue, and the proliferation of APIs soon created confusion. APIs were developed for different platforms or different applications; some were built for consumer-facing applications; and others served as internal system interfaces, from channels to the middleware to product applications. There was a lack of API coordination across the different businesses. For example, DBS's Consumer Banking Group and Institutional Banking Group had different APIs that were retrieving the same data. As a result, external partners would need to talk to various teams and work with a plethora of APIs as they sought to deliver new value propositions. API governance had to be tightened through proper inventorization of APIs, the creation of a single portal to publish all APIs, having a single external API gateway across different platforms, and ensuring common standards for the API infrastructure and a consistent way of interacting and authenticating the interface with all partners.

At the same time, it was also necessary for DBS to guide its external partners in a systematic manner. Partners varied widely in terms of their competencies (e.g., UX design, customer journey, technical integration), so the bank had to take into consideration differing task scopes and levels of technical guidance required. For the onboarding of new partners, DBS laid out a three-step process in accessing its digital services: sign up online for a DBS developer's account; experiment in a secure sandbox, in which the partner can test a linkage to a DBS API; and eventually request production access for the connection to go live. Where necessary, DBS would bring in its own expertise to work together with its partners. DBS also formalized a 4D ecosystem engagement model

19 "Banking without branches, DBS digibank India gains 1m customers in a year," DBS, June 8, 2017, https://www.dbs.com/innovation/dbs-innovates/banking-without-branches-dbs-digibank-india-gains-1m-customers-in-a-year.html.

(discover, define, develop, and deploy) in which DBS and its API partners would go through end-to-end customer journeys to clarify the digital value propositions to the bank, to customers, and to the partners before proceeding to develop and deploy these APIs. Fast API execution capability was to be a key differentiating factor for DBS amidst stiff competition:

I think the ultimate competitive advantage is in the execution, in the speed of change. How fast can you develop that capability when the market shifts? I think ultimately, the differentiation will be the culture itself. It will be the people who develop that capability. Everybody can copy the API specs. The reason why we publish the specs out there for anybody to see is because we don't think that's a competitive advantage. It's a matter of how you collaborate, source the idea, and make it into a product. How fast can you do that? How easy can you make yourself be to work with your partners, so that they can deal with you at a lower cost and have a much better experience? Then, people will come to us rather than to other banks.

DANIEL LI, HEAD OF API PARTNERSHIPS

DBS also developed new partner management capabilities:

One challenge is that the bankers are used to dealing with two types of business entities. It's either you are a customer of DBS or you are a vendor. They have different kinds of governance structures from a legal compliance perspective, even for procurement. They have different kinds of agreements, different checklists, and different due diligence processes. But a "partner" is neither a customer nor a vendor. It's more of a peer-to-peer relationship. Can we borrow these structures to fit to it? No, we can't. So we have to work out some partner-friendly terms and conditions, how we do due diligence and so on. We have to be more humble if we want to be part of that ecosystem and part of the community; we can't treat them like a vendor. It's a different kind of dynamic.

DANIEL LI

One key piece in managing partner relationships was DBS's API collaboration agreement. It spelled out a more partner-friendly set of terms and conditions to establish early a common ground of mutual understanding, as well as conformance to relevant compliance requirements as a bank.

In addition, DBS also sought opportunities to go upstream to strengthen its presence in the digital economy by stepping up its investments in complementary e-marketplaces. In 2017 and 2018, it invested in DBS Car Marketplace (Singapore's largest direct seller-to-buyer car market), DBS Electricity Marketplace (which allows homes to seamlessly switch to other retailers following the liberalization of the retail electricity market in Singapore), DBS Property Marketplace (which connects tenants and landlords, as well as home buyers and sellers), and Carousell (an online classifieds site which enables anyone with a mobile phone to buy and sell things online). It also entered into cross-referral agreements with regional peer-to-peer lending platforms Funding Societies and MoolahSense.

CREATING A 26,000-PERSON START-UP: MAKING PEOPLE ITS KEY DIFFERENTIATOR

DBS, a 50-year-old bank with a large legacy workforce, also realized that successful digital transformation required targeted focus to reenergize its people. Recognizing the galvanizing force of strong alignment to a shared vision, the bank's management decided early in the process to take a whole enterprise approach towards digital transformation.

We weren't going to create this little starter innovation unit as an aside that was to disrupt the bank, which you've seen many organizations do. The whole bank was coming with us, and therefore we thought of ourselves as a 26,000-person start-up.

DAVID GLEDHILL, CHIEF INFORMATION OFFICER

An Innovation Group was established to foster cultural change. It reported to Gledhill and was under the direction of the Innovation Council. Broadly, it had an innovation management team that fostered agile practices and organized human-centered design task forces. There was also a start-up partnership team that interacted and developed the network with the fintech start-up community. In addition, it had a think tank that regularly scanned the markets for emerging trends and actively raised awareness of these topics among the senior leaders of the bank. This team also facilitated collaboration with start-ups by organizing hackathons, accelerator programs, and start-up exchange programs in which promising start-ups were brought in-house to address a set of business challenges solicited from the business units (BUs). Finally, innovation advocates were placed in each BU to ensure that the agenda of the Innovation Group was embedded inside the BUs.

While the Innovation Group set out to increase bank-wide digital innovation, its focus in DBS was not to create innovations per se, but to create innovators:

How do we build that innovation mentality into everyone? We don't want to create a little central team that's tasked to innovate the future. We want to democratize it and make it part of everyone and every day. So we democratized the training and gave the framework out to everyone, and then everyone was tasked to create their own journeys. It was very much around the concept of letting a thousand flowers bloom, because they would decide for themselves the size, magnitude, impact of that journey. Some people picked up a journey that was covering the entire organization, and some picked up journeys that were much more focused on a particular product.

BIDYUT DUMRA, HEAD OF INNOVATION

To DBS, people were the key differentiator, and its aspiration was to cultivate its people to embrace start-up qualities of being customer-obsessed, data-driven, risk-taking, agile, and continually learning (see figure 4).

We have a very firm belief in this notion of growing our own timber. The fact is that in this day and age, technologies and resources are very democratized. We use Amazon Web Services, but literally, a start-up with five people in a garage also has access to the same Amazon Web Services. If technology, resources, and information are all democratized, then your key differentiator is going to be how you use it, not what the technology set is. How you use it is about people. Our entire investment is in people. The world is changing so fast. We don't even know who is going to be a competitor around the corner. But if we have the right people with the right mindset, we will figure it out. If we can cultivate this huge workforce of potential innovators, creative people who can think and really attune themselves based on whatever you give them, that will be where our success lies.

BIDYUT DUMRA

Figure 4: Qualities of a 26,000-Person Start-up

Source: DBS

DBS invested considerable resources to reskill and upskill[20] its people, especially its legacy workforce, some of whom had been with the bank for over 30 years. It announced in 2017 a commitment of SGD$20 million over the next five years to equip its employees with digital capabilities. The program, designed for large-scale participation by all bank employees, comprised several aspects: artificial intelligence-powered e-learning, experiential learning, grants and scholarships, and innovative learning spaces. More than 10,000 training sessions were conducted at the DBS Academy each year.

These programs were designed to target executives at every level. For example, at the senior management level, there was a program called the Maker:

Maker is where we take traditional bankers and we make them technologists. They have to commit to having lunch with us for the entire week. When they come in on Monday, they have almost zero knowledge of technology, maybe 3D printing or IoT or data, and by Friday they are hands-on; they have built something. It's a completely immersive program that has to do with them being hands-on, and by Friday they have literally created and crafted something using technology. And then they are in a position where they can go back to their teams, such as wealth management or institutional banking, and they're now able to draw on this expertise and then apply it.

BIDYUT DUMRA, HEAD OF INNOVATION

In addition, DBS redesigned its internship program, creatively named the DBS UNI.CORN management internship program.

With the UNI.CORN program, we were basically taking millennial challenges from the bank. We invited university students to apply, and this year we had about a thousand five hundred applicants. We did psychological profiling on them, aptitude profiling, and then we chose 60 candidates. The 60 came in and spent one day with us, and we did a hackathon. At the end of that, we selected 24 and "molded" them into start-ups to address these millennial challenges.

BIDYUT DUMRA

Young talents in the management associate program were also tapped in a reversed mentoring program where C-suite leaders were taught social media and its business potential.

DBS supported flexible staff participation in internal crowdsourcing, customer journeys, and pilot projects on emerging technologies. Projects in one department could be made open to volunteers from other departments. The HR department also sorted out a flexible working scheme to allow bank staff to leave their day role and join a new team (either on a part-time or full-time basis) to work on innovative ideas.

Daniel Li, DBS's Head of API Partnerships, said: "How do we do innovation? It's both inside out and outside in. We want to make sure that these two sides actually married and were able to collaborate and create sparks out of this kind of interaction." DBS's digibank, for example, was groundbreaking in that it combined a set of new technologies including biometrics, AI, an intuitive recommendation engine, and soft token technology. The AI technology came from Kasisto, a spin-off from the United States-based company that created Siri for Apple. The recommendation engine and the virtual key were products of two Singapore start-ups, Moneythor and V-Key.

The bank also built innovative workspaces and separate facilities for experimentation. One of these was DBS Asia X (DAX), in which DBS staff collaborated with start-ups to improve customer and employee experiences through tech innovation.

20 "Reskilling" refers to retraining employees. "Upskilling" refers to teaching employees additional skills to upgrade their expertise and capabilities.

CHALLENGES IN CHANGING MINDSETS

Reflecting on the challenges of instilling a new mindset in DBS, CIO David Gledhill commented:

Mindset change is a journey. Not everybody's going to get on board at the same time. Some people are going to outright reject it. We describe it as teaching cats and dogs to swim. You put the dogs in the water and they happily all react and have fun. Put the cats in, not so much. Some cats just look miserable and some fight back. We have seen all these behaviors! Gradually, more and more teams have tried and tested it. It's worked pretty well and we've had good outcomes, which has promoted its use. We're not forcing it onto people, but encouraging a kind of seductive adoption where more and more teams implement it over time, after being exposed to and seeing its benefits.

DAVID GLEDHILL, CHIEF INFORMATION OFFICER

Changing culture at the scale of the whole enterprise required DBS to carefully encode desirable cultural values (e.g., being customer-obsessed) into crystal-clear messaging to drive behavioral change on the ground.

You really need to boil down the essence of what your mission is and what the problem is that you're trying to solve. If you can crystallize that into a message that everybody can grasp into a single page, then you have something very powerful that you can start to push. When we looked at customer service, for example, we came up with RED: Respectful, Easy to deal with, Dependable. It was very clear, something people could act on, and that drove massive change through the organization. When we thought about how we wanted the business to digitalize, we came up with a very simple framework of Acquire, Transact, Engage (i.e., Acquire digitally, Transact digitally, Engage digitally), and drove metrics around that. Without those clear missions, we'd have had people going in all sorts of different directions.

DAVID GLEDHILL

In particular, fostering a new culture of encouraging experimentation and accepting failure was difficult in an organization where flawless execution had been the norm.

The most difficult thing for us was that we had to learn how to learn. What I mean by that is, we understand banking, and we understand credit and market risk and how to build great mortgage systems. But when you get into this new digital space of experimenting with ecosystems, with start-ups, with launching a brand-new product that nobody's ever tried in a new market, you get lots of things wrong. That was hard for us to accept. You'd have these meetings and people would ask, "How could we possibly not have known that?" Well, it's an experiment—of course we don't know. Learning that it's okay to experiment, that many of the experiments we try will fail, and for everybody to accept that and actually treasure it, was a very difficult change to make.

DAVID GLEDHILL

In addition, DBS also wanted to win over both the heads and hearts of its people in its digital transformation. Various initiatives had been implemented to make employees feel valued, experience growth, and have fun in the journey of transformation. One example was an app, iTQ (I thank you), a peer recognition system where staff can appreciate everyday contributions from co-workers through notes or reward points.

Often when organizations undertake digital transformations, they focus on winning the "head" through vision and data-driven processes. Equally, if not more important, is winning the "heart." We must ensure employees are aligned on this journey by recognizing and appreciating their work and giving them opportunities to be the change and make a difference… We can't hope to be a big start-up with a digital culture while keeping everything centrally controlled. We have been working to enable

empowerment throughout the organization, and we have seen that little things go a long way in changing the culture.

LEE YAN HONG, HEAD OF GROUP HUMAN RESOURCES

MEASURING VALUE CREATION FROM DIGITALIZATION

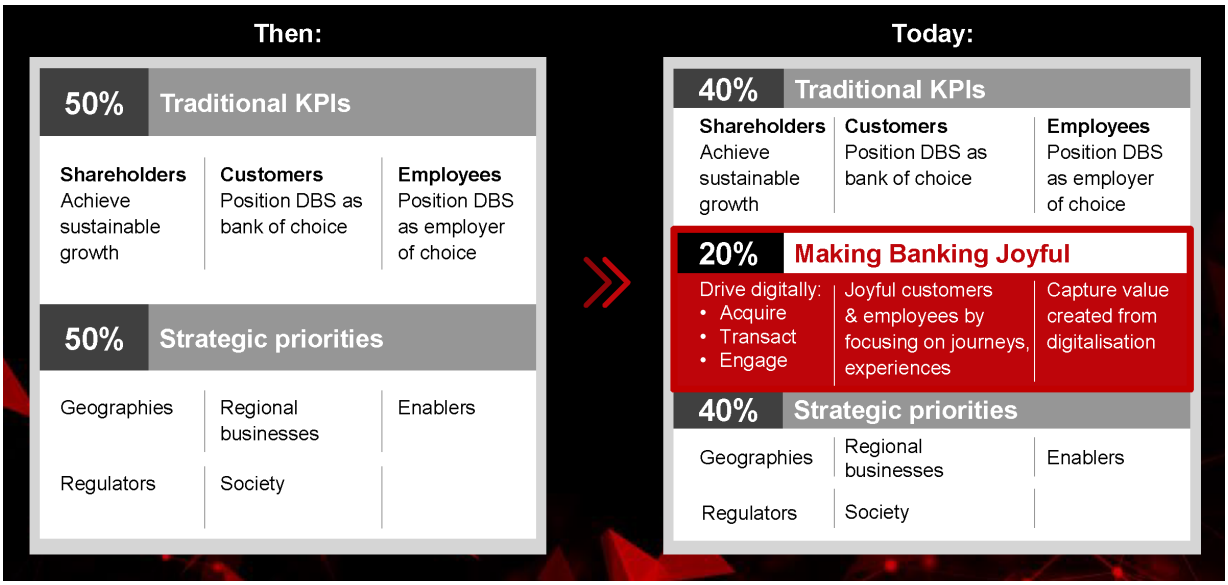
In embarking on such a massive transformation, DBS was careful not to be consumed by the digital agenda.

Transformation could consume every hour of every employee in the company for the next five years. Obviously, we wouldn't make any money, and that wouldn't be a good outcome. You have to balance it. The way we balance it is through group scorecards, which really drive everything we do and clearly indicate to people the amount of time we expect them to spend on certain areas. You have to embed this thinking into the management fabric of the company. We obsess over those scorecards and critique each other's scorecards. It is a collective and collaborative process to come up with each person's scorecard and the weightings of those metrics. Once that's set for the year, it's very clear what everyone's mission is.

DAVID GLEDHILL, CHIEF INFORMATION OFFICER

Using a balanced group scorecard (see figure 5), the bank ensured that sufficient attention was devoted to driving performance outcomes in its traditional businesses as well as its digital transformation agenda. The top part of the scorecard (40 percent) comprised financial metrics, customer metrics, shareholder value-add, and revenue generation for its traditional businesses. The middle part entailed three KPIs that drove DBS's mission of "making banking joyful" (i.e., drive digitally, joyful customers, and digital value creation). These formed the core of the bank's digital transformation focus, and were collectively ascribed 20 percent of the scorecard value. The bottom part of the scorecard (40 percent) tracked the outcomes of strategic projects such as automated algorithm-based lending and future-ready workforce development (see figure 6).

Figure 5: DBS Group Scorecard



Source: DBS

The three KPIs tracked in the middle section relate to DBS's drive to "make banking joyful." "Drive digitally" measured the channel share of digital acquisitions, transactions, and engagement with customers. "Joyful custom-

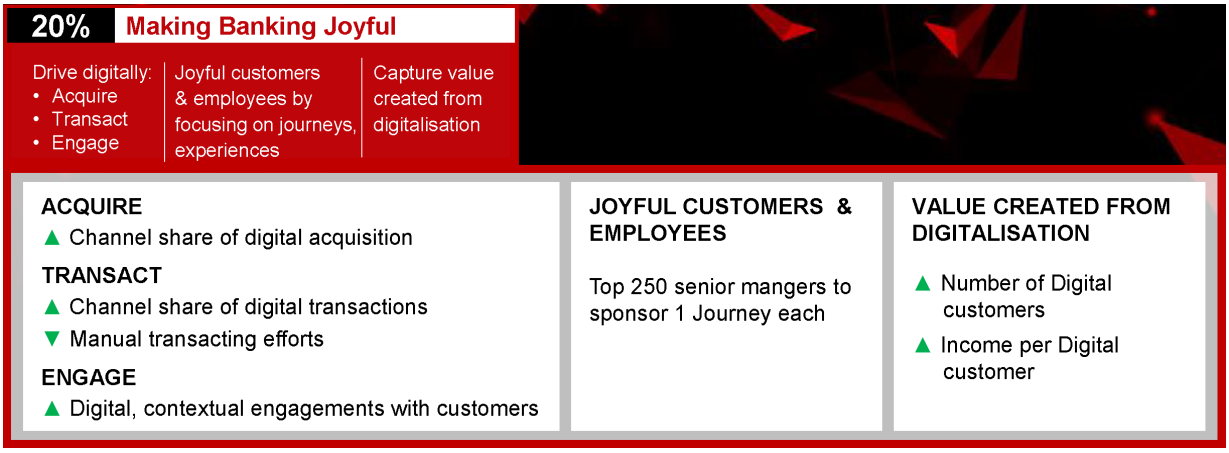
ers" focused on improving the experiences of customers and DBS employees. For instance, the top 250 senior managers in DBS each sponsored such a journey in 2017. "Digital value creation" tracked the number of digital customers and income per digital customer by each BU. DBS's customers were categorized as digital or traditional customers based on their interactions with the bank. Digital customers were those who made a product purchase or segment upgrade via digital channels; carried out more than 50 percent of their financial transactions via digital channels; and/or carried out more than 50 percent of non-financial transactions via digital channels. Those who did not do so consistently were classified as traditional customers. All associated income and costs attributed to each customer segment were tallied and tracked for each BU. Given the better prospect of digital customers for higher returns and faster income growth relative to traditional customers, DBS sought to increase digital migration of its customers over time.

Chng Sok Hui, Chief Financial Officer of DBS, remarked:

Because one can manage only what one measures, by tracking digital value creation, we have been able to draw up an effective business plan to drive digital behaviors among customers.

CHNG SOK HUI, CHIEF FINANCIAL OFFICER

Figure 6: Making Banking Joyful KPIs



Source: DBS

DBS is believed to be the first bank in the world to have developed a methodology (tested internally over three years) for measuring the financial value created by digitalization. These measures, for example, indicated that digital customers made up 42 percent of DBS's total customer base in 2017, but contributed 63 percent of income and 72 percent of profit before allowances. Since 2015, income from digital customers had also grown at a compounded annual growth rate (CAGR) of 27 percent—compared to a 4 percent decline for traditional customers—and presented a return on equity (ROE) of 27 percent in 2017, which was 9 percent more than the ROE of the traditional segment. Over time, DBS expected the proportion of digital customers to increase from the current 42 percent to 50–60 percent; this was projected to drive further improvement in shareholder value creation.

Euromoney stated that the methodology was a new and important step in being able to explain at a highly granular level exactly how and why a digital path is likely to be value-creating. "Quantifying exactly what digitalisation means for profitability—and it means plenty—is a useful tool not only for investors but the whole industry. The market is so impressed by what it has heard from DBS that it's beginning to be revalued as a bank crossed with a tech stock," noted the magazine.[21]

21 "DBS named best bank in the world," DBS Newsroom, August 24, 2018, https://www.dbs.com/newsroom/DBS_named_Best_Bank_in_the_World.

FUSING BUSINESS AND TECHNOLOGY THROUGH PLATFORM REORGANIZATION

As the digital transformation journey gained momentum, DBS also came to the realization that it needed to evolve into the next stage of transformation, i.e., to reorganize the company around technology platforms.

Today, we have an organization structure in place, but the business and tech parts are separate in terms of how they're led, how they're managed, how they're funded. This platform transformation aims to redesign the way we function and work and operate, so that we can have more control over what we build and the way we work. What we build in terms of designing for modern systems, designing for data, and for the ability to work with ecosystems; and the way we work in the sense of being customer obsessed, data-driven, continually learning, agile, and challenging the status quo.

BIDYUT DUMRA, HEAD OF INNOVATION

A platform refers to a combination of technology assets and the talents that support, manage ,and guide those tech assets, as well as the funding underneath the technology and the talents. For example, all tech assets, all the staff in related technology and business, and all related funding that helped to reduce friction for employees or improve employee experiences (for example, around expense claims, or travel) could be grouped into the "employee" platform, whose mission would be to create a fulfilling and conducive working environment for all bank employees.

A list of "platforms" had been identified. Broadly, these platforms could be clustered into four high-level platform categories: business platforms, enterprise support platforms, enterprise-shared platforms, and enabling platforms. Business platforms focused on front-facing businesses, such as consumer banking business, enterprise banking business, and treasury and market business. Enterprise support platforms were responsible for supporting functions that ran across all businesses, such as finance, HR, and core banking. The role of enterprise-shared platforms was to support multiple businesses; such common services included customer data, payment, customer servicing, API development, and teams that developed emerging technologies like AI, blockchain, and chatbots. Enabling platforms facilitated technology infrastructure, cybersecurity, access management, enterprise architecture, and delivery enablement.

A lot of these platform boundary decisions could have been much more radical. A lot of them could have made much more sense. We could have ended up with 25 platforms, or 10 of them. But if we had ripped the existing organization apart, it would've been too much. Just managing that change and letting the dust settle, we would not have got to where we wanted to be. This is where we are now, but this is not where we might be in 2020.

BIDYUT DUMRA

To truly operate like GANDALF, all incentives and decision-making processes had to be realigned. In Google, for example, "80 percent of its senior management were technology people, rather than business people." Taking a more moderate approach, DBS established a two-in-a-box[22] system to govern these platforms.

From a governance perspective, we wanted to pursue a two-in-a-box approach. That's related to the entire notion of us wanting to operate in the guise of a start-up. In a start-up, the two main people are the CEO and the CTO. The business and tech are joined. If you're a digital business, those two have to be conjoined or synced. So for every platform, we have a business and a tech lead. These two people make all the decisions for that entire platform: they have joint KPIs, so they are both delivering one

22 A two-in-a-box system or approach refers to a management approach in which two (or more) people are given equal leadership authority and responsibility for a task or set of tasks, often in complementary roles.

dream. For some platforms that run across multiple businesses (e.g., enterprise shared platforms), we have a council because there could be resource conflicts that might happen there.

BIDYUT DUMRA, HEAD OF INNOVATION

All the tech talents (i.e., the staff in Technology and Operations) were reorganized. Some of them might have the same tech boss, but now they might have a new business boss. This completely reshaped their KPIs. In the past, technology was responsible for resilience or system incidents as well as technical debt, and business was responsible for feature functions, service quality, customer satisfaction scores, and other business indicators. In a platform organization, a tech lead for a business platform was to share responsibility for the P&L; at the same time, the business lead would share responsibility for tech KPIs and tech support budgets, which would be treated as a business expense.

From that perspective, the processes of "build," "operate," and "maintain" are all collapsed. Before, the business would raise the capital budget to build the platform, but the tech team would be operating and maintaining it, so that budget would sit with the tech team. If they took shortcuts on the build, which raised the costs of operations and maintenance, then that was a misalignment. This reorganization brings everything—idea conceptualization, delivery, operation and maintenance, and the whole technical stack of skills—completely together. No excuses. From a dependency or future-proofing perspective, it is to make sure you don't take too many shortcuts in the short term which might hamper the platform in future.

BIDYUT DUMRA

The reorganization around the platform would take the fusion between business and technology to a new level. It would now operate on a "single backlog prioritization model."

The business and the tech backlogs have come together. For example, with HR, the intent on the business side might be to automate the talent search process and the onboarding process. Maybe they have an issue concerning attrition in the millennial segment—those are items in the business backlog. From a tech perspective, they might have a backlog item like needing to upgrade the PeopleSoft software, which requires a hardware upgrade. Or they have a mobile app for engagement, and five things need to be done on that. You can see that those are two separate backlogs. Now mesh those together, and work on them with the same pool of people. They may be interrelated, or something that looked important earlier might not be any longer. What we can appreciate is also that if they have a backlog item that doesn't seem to have a tech aspect, maybe the latter is what they're missing and need to implement! With these backlogs coming together, the relationship is changing; the dependency and the conversations are changing to the point where we say the intent is that "business equals technology" and "technology equals business."

BIDYUT DUMRA

The Innovation Group was actively involved in facilitating the platform reorganization. Every platform had a digital transformation partner from the bank who worked with the core platform team and facilitated conversations to define the respective platform strategy, roadmap, and architecture.

We call ourselves the "sherpas." We guide them up the mountain. We have the map, we tell them, "These are the tools that you need," and we accompany them all the way. It's their mission, but we are going to help them.

BIDYUT DUMRA

A key mission of the Innovation Group was to get these managers to stretch their imagination in anticipating and planning for the future.

Our major mission is to get the BUs on board and get them to stand up and do things differently, think a bit further down the road and stretch their imagination and plan horizons further into the future. Quite often, from the legacy way of doing things in the bank, you're only looking at next year, or at most, maybe two years down the road. In the last couple of years, the Innovation Group tried various means to see how we can stretch that horizon a bit further down the road, say five years, or even beyond five years.

BIDYUT DUMRA, HEAD OF INNOVATION

One example was a future-casting intervention called "North Star" where managers were taken back in time to see how the evolution of technology has shaped business and the world:

We first highlighted to them that if you look at the world 12 years back, everything that we have now didn't exist back then. Facebook, smartphones, and all the other stuff. 12 years back, you would not have made the decisions that we're making now, which is why we are in catch-up mode. Then, we basically take them into this future-casting scenario where they envision the world in 2030. What is payment going to look like, what do we anticipate customers will want to be served, what do we anticipate enterprises will want to be served etc. Then, we start building a roadmap to that world.

BIDYUT DUMRA

This process was backed by extensive research conducted by the Innovation Group, as well as the knowledge and experience of business leaders and technology leaders in the field.

We then jump back in time, so our managers end up with a three-year roadmap, and within that we ask: what are you going to retain; what are you going to extend; what are you going to imagine? In about six weeks, about 15 of the platforms will be holding a fair, and each of the platforms will be saying, "Well, this is what we've decided." Managers are going to be challenged with regard to why they think the world is going to be like that, what they've chosen as their vision, and the different components that will get them there. Then, once they go through this challenge model, they'll go into the budgeting cycle.

BIDYUT DUMRA

REIMAGINING BANKING IN THE FUTURE

Venturing into uncharted territory, DBS needed to relentlessly reimagine banking to be future-ready. It continuously projected possibilities over the next 12 years, envisioning itself in 2030. At the 2018 DBS Asian Insights Conference, DBS CEO Piyush Gupta spoke about the challenges presented by a VUCA (volatile, uncertain, complex, and ambiguous) world and the related difficulties in seeing the future.

I have to confess: it's not always clear that you can call the future. But it is clear that you must have a point of view on the future. You want to make sure that you have thought about it enough such that you have enough ideas to be able to be adaptive and to be responsive. The winner over the next 10 to 12 years will be people who have been able to build nimbleness, flexibility, adaptability, and responsiveness into their way of working.

PIYUSH GUPTA, CHIEF EXECUTIVE OFFICER

The strategic shift towards a platform-based organization was yet another way DBS reinvented itself for greater "nimbleness, flexibility, adaptability, and responsiveness" by fusing business and technology in its organizational DNA. Managed well, this push should position DBS well to achieve more ambitious innovations, greater differentiation, and the next level of productivity in the new digital era. Indeed, DBS was already catching a glimpse of its GANDALF aspiration, with its shares increasingly being perceived and valued like technology stocks.

To DBS, the digital transformation was an ongoing journey in building the next-generation enterprise. It was developing the core capabilities to be ready for the digital future, i.e., the agility to scale technology infrastructure, to delight customers, to connect with ecosystem partners, and to innovate in ways that are unimaginable today.

What do you see in the future of banking, in a world of new technologies such as analytics and AI? Do you see a future without banks? Do you see technology companies becoming banks? Do you see banks reinventing themselves beyond financial services? Whatever the future holds, DBS certainly seems confident and ready to counter disruptive threats and to seize emerging growth opportunities when the time comes!

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Information as of March 2019

MIT CISR is funded by Research Patrons and Sponsors, and we gratefully acknowledge their financial support and their many contributions to our work.

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