

CASE STUDY

DBS BANK: LAUNCHING AN AI-ENABLED DIGITAL BANK

WINNER OF CELENT MODEL BANK 2018 AWARD FOR
BEST DIGITAL BANK

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CASE STUDY AT A GLANCE

FINANCIAL INSTITUTION	DBS Bank
INITIATIVE	Launching digibank powered by KAI from Kasisto and Infosys Finacle
SYNOPSIS	DBS Bank launched an entirely new mobile-only bank, digibank, in India and Indonesia. Groundbreaking features include 90-second account opening (in India), wealth management, payments, and PFM. In Singapore, key features of digibank have also been introduced. A foundational element of the bank is the conversational AI-enabled virtual assistant from Kasisto, allowing users to answer thousands of different inquiries.
TIMELINES	<ul style="list-style-type: none"> Feb 2015: Proof of concept Aug 2015: Friends and Family pilot Oct 2015: Soft Public Launch April 2016: DBS digibank India Oct 2016: DBS digibank virtual assistant on the Public Web in India Dec 2016: DBS digibank Singapore (Facebook Messenger) Aug 2017: DBS digibank virtual assistant on the Public Web in Singapore Sept 2017: DBS digibank Indonesia Bahasa (mobile app)
KEY BENEFITS	<ul style="list-style-type: none"> About 80% of customer inquiries handled by the bot 10,000 questions answered by the KAI virtual assistant 1.8 million new customers on digibank India
KEY VENDORS	<p>Infosys Finacle</p> <p>Kony</p> <p>Kasisto</p> <p>MoneyThor</p>

CELENT PERSPECTIVE

- Broad digital transformation by DBS Bank:** DBS Bank went from struggling with its customer service to becoming one of the most liked and well-respected banks in Asia. The vision of its CEO, Piyush Gupta, completely changed the organization from top to bottom, with the implementation of a series of changes across culture and technology. Celent is impressed with the variety of measures taken, such as reskilling executives and creating new success metrics to measure effectiveness of its transformation.
- Leveraging a separate mobile-only business unit to drive growth:** DBS Bank originally launched digibank as a stand-alone offering. After independent success, the bank brought it in-house and began to use it as one of the primary bank products they were offering. They have also used it as an extremely cost-effective way to expand into new geographies. Most institutions which launch digital subsidiaries experience challenges gaining adoption. Others which use them as sandboxes never fully realize their potential as offerings at the main bank. DBS Bank did both, and Celent found it an extremely compelling example of best practices.

- **Successfully implementing a conversational-AI virtual assistant:** Digibank's virtual assistant can answer thousands of different questions and successfully answers about 80% of customer inquiries. Celent is impressed with the competence of KAI Banking compared to other applications of conversational intelligence in banking. digibank with KAI Banking is a model for what good looks like in implementing an intelligent virtual assistant.

DETAILED DESCRIPTION

Introduction

Headquartered in Singapore, DBS Bank is a leading financial services group in Asia, with 280 branches across 18 markets. The bank is the largest in Southeast Asia, with more than \$395 billion in assets. DBS Bank was set up by the Government of Singapore in 1968 to take over industrial financing from the Economic Development Board. It has a growing footprint in three major axes of growth: Greater China, Southeast Asia, and South Asia.

DBS is at the forefront of digital technology and has been named “World’s Best Digital Bank” by Euromoney Magazine. The bank has also been recognized for its leadership in the region, receiving awards for “Asia’s Best Bank” by The Banker and Euromoney, and “Asian Bank of the Year” by IFR Asia.

Table 1: DBS Bank Snapshot

	DBS BANK
YEAR FOUNDED	1968
REVENUE	S\$11.9 billion (US\$ 9.08)
ASSETS	S\$518 billion (US\$ 395.03)
GEOGRAPHICAL PRESENCE	Markets: 18
EMPLOYEES	24,000+
OTHER KEY METRICS	Institutional Banking customers: > 200,000 Consumer Banking / Wealth Management customers: > 8.8 million
RELEVANT TECHNOLOGIES AND VENDORS	Infosys Finacle (Core banking and wealth management) Kony (App) Kasisto (AI-assistant) MoneyThor (PFM)

Source: DBS

In an increasingly digital world, banks are pressed to deliver on the customer experience expectations brought on by emerging technologies. Consumers are looking for more from their bank partners.

DBS believes that financial services will fundamentally change in the future — banks today will look nothing like their traditional selves. With that in mind, the bank spent the last three years putting together an aggressive digital transformation agenda. It involved changing culture and

the mindset of its people, re-architecting its technology infrastructure, leveraging big data, and applying biometrics and emerging technology to the banking experience.

To accelerate this transformation, DBS Bank launched a major initiative: a new mobile-only bank called digibank with a view to enabling customers to “live more, bank less.” The entire design was focused on meeting the needs of a digital consumer. Design thinking principles went into the UI and UX development, while new emerging technologies were embedded into the experience.

Underpinning the use of modern technology was the digibank digital assistant, powered by Kasisto. To DBS Bank, Kasisto’s conversational AI platform is the face of digibank. It can answer thousands of different questions and successfully handle about 80% of customer requests. DBS also needed an open and flexible core platform to drive its aggressive acquisition strategy, choosing Infosys Finacle.

Launched first in India in 2016, digibank has since been rolled out to Indonesia and Singapore, and has been a major success. digibank India is the first of its kind in India and costs a fifth of the operating expense of a normal institution. More than 1.8 million customers have joined digibank India so far. With digibank, DBS Bank has gone from being known for having customer service improvement opportunities to being recognized as a leader.

Opportunity: DBS Bank’s Digital Journey

The CEO of DBS Bank, Piyush Gupta, joined the institution in 2009 and has been instrumental in charting its digital transformation. In 2014, the bank started down the road to really becoming a digital institution given encroachment into the banking space by emerging fintechs, large tech giants, and the startup world. The bank concluded that they needed to digitize completely in order to meet the expectations of a modern consumer. It wouldn’t be enough to try to work with legacy technology and put “lipstick on a pig.”

Killing paper became a mantra within the organization. This mindset of going digital pervaded the culture and required dramatic rethink of how to deliver financial services. The bank also used IDEO, a global design and innovation company, to rethink the way in which they deployed products.

DBS Bank identified and established seven critical skills that an executive at the bank must have. They included agile ways of working, digital technologies, journey thinking, and an understanding of data. These skills would allow them to be effective as an organization, providing tech literacy for understanding vendor products and technologies.

The bank started using two new metrics to help identify opportunities. “Customer wait time” was a classic measure in how long it took to complete a goal. How long were customers in line at a branch? How long did it take them to complete a wire transfer? The bank also looked at “customer waste-time,” assessing areas where customers needed to come multiple times for data or paper documents that could easily be automated or gathered electronically.

They even did a segmentation exercise looking at digital users versus traditional users. They found almost no correlation with age or income, signaling to them that this was behavioral and in line with broader market trends.

Overall, DBS Bank identified the following strategies:

- Shifting to a customer-centric design.
- Making banking invisible.
- Eliminating “waste.”
- Being respectful, easy to deal with, and dependable.

- Reducing the amount of formalities, paper work, and processes.

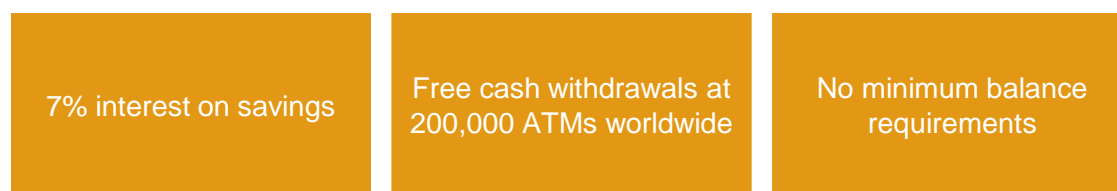
With that in mind, DBS Bank launched digibank, an entire bank in a phone that would be able to meet evolving customer experience expectations.

Solution: digibank

Digibank is the very first mobile-only bank in India. When the bank originally started the project in early 2016, an entirely separate team was created to build the offering. The bank ran it with an agile methodology, similar to a start-up. It had a separate P&L and a separate process for vendor procurement which allowed it to make decisions quickly and autonomously. After some moderate adoption and success, DBS Bank brought digibank back into the retail consumer business of the main bank. It became the primary bank product focused on digital consumers.

In India, digibank has two main products: eWallet (deposit account) and DigiSavings.

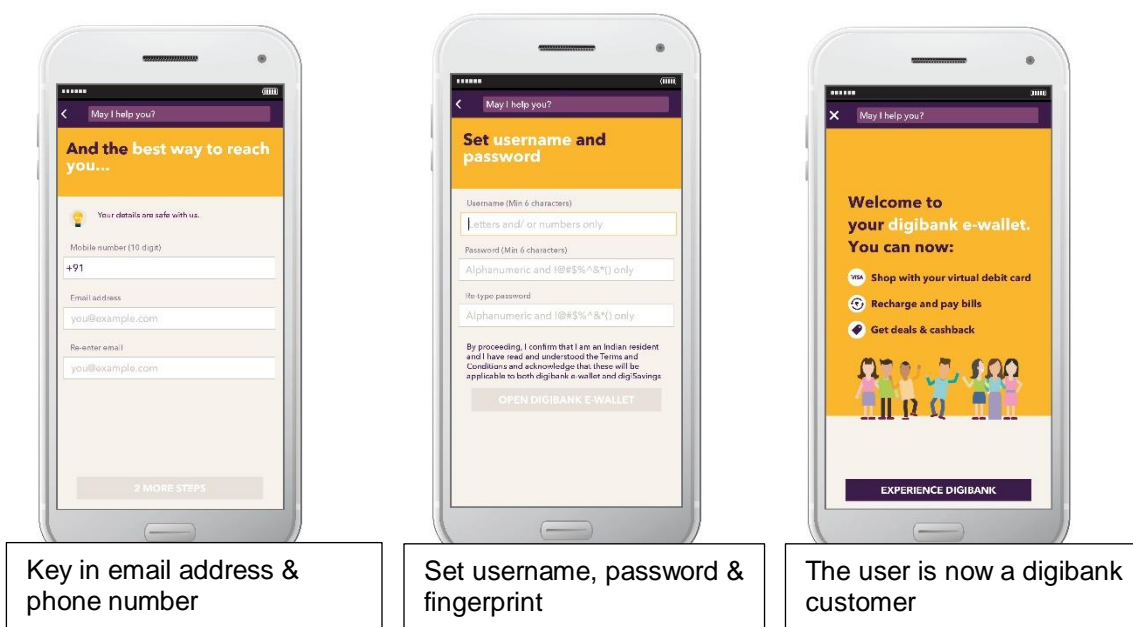
Figure 1: Example Elements of a digibank Account



Source: DBS Bank

One of the primary selling points of digibank is the account opening process, DBS looked at process reengineering to save the customer waste and wait time in the process. A new customer can set up an eWallet account in just 90 seconds.

Figure 2: Account Opening



Source: DBS Bank

Account opening can be done easily digitally or at an extensive network of outlets run by DBS' partners; for a start, this includes over 500 cafes across India. Significantly, there is no paperwork involved. KYC is done by using the Indian Aadhaar card.

Aadhaar

- *Biometrics ID in India*
- *Issued to more than 1 billion Indians*
- *World's largest biometric ID program*

In Indonesia, to open an digibank savings account, all customers have to do is arrange to meet a digibank agent, who will assist them to do so using a biometric device on the spot. DBS has made this possible by leveraging E-KTP, Indonesia's biometrics-enabled ID program.

Capabilities

Digibank offers customers interesting capabilities that allow it to stand out in the market. The services are designed to help customer make informed financial decisions online with intuitive user journeys. The bank has leveraged the flexibility of the core platform to enable tailored product creation for various user scenarios.

Payments

Digipay gives users access to India's Unified Payment Interface (UPI) directly through the application. Users can send or receive money using a virtual "@DBS" address without needing any account information. No need for account details or passwords.

Unified Payment Interface

- *Real-time payment system in India*
- *Built over Immediate Payment Service (IMPS)*

For merchant payments, digibank supports Bharat QR, allowing customers to pay at any QR-enabled POS or websites. They can use the app to pay or receive.

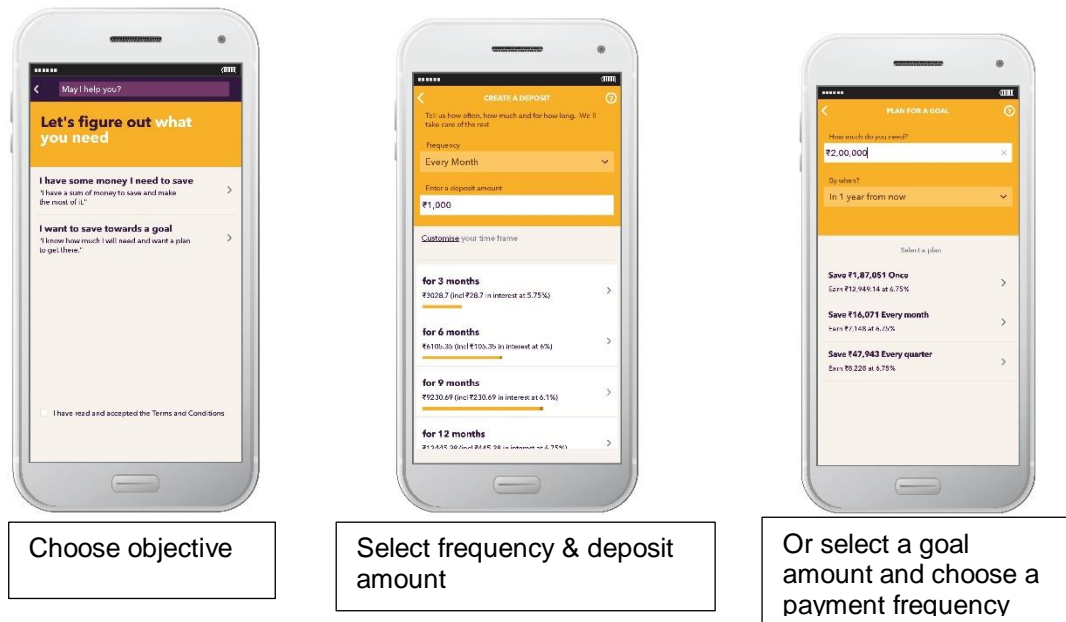
BharatQR

- *Integrated payments system in India*
- *Developed by NPCI, Mastercard, and Visa per directions by the central bank*
- *Interoperable with all Indian Banks*

Personal Financial Management (PFM)

Digibank offers customers its budget optimizer, which allows them to budget, track expenses, and analyze purchase patterns. DBS uses MoneyThor for PFM. MoneyThor was a winner at Finacle Fintech Connect 2017 and is headquartered in Singapore. MoneyThor is also an Infosys Finacle Fintech Partner and a pre-integrated part of the Finacle solution.

Figure 3: Budgeting and Goal Setting



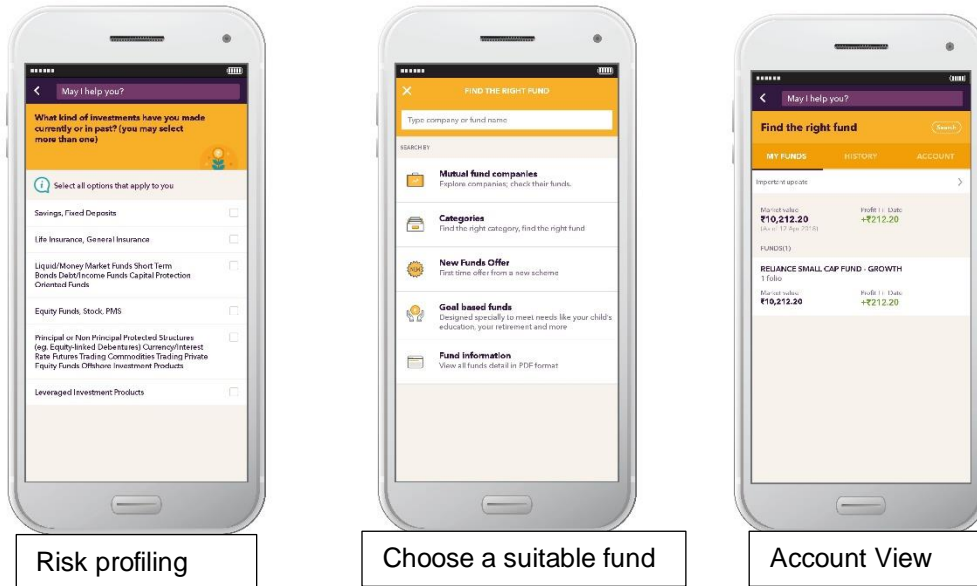
Source: DBS Bank

Digibank's PFM is built on value-driven analytics. It's API-enabled and sits between front end and back end systems. For example, it can make sense of customers' spending habits to reward them with relevant, contextual marketing offers such as restaurant discounts or coffee vouchers. The digibank budget optimizer looks at spending and sends alerts based on whether or not the consumer is above or below their normal cash flow.

Investments

Digibank also lets customers manage mutual fund investments. They can purchase, track, or sell their investments directly from the app. Mutual fund investment plans are provided by DBS Bank and include automated alerts or automated monthly investments. The bank offers more than 500 funds in more than 25 categories from 10 fund houses. For this offering as well, DBS has relied on Infosys Finacle and deployed their Wealth Management solution. Going ahead, the bank plans to expand its product coverage beyond mutual funds.

Figure 4: Investment screen shots

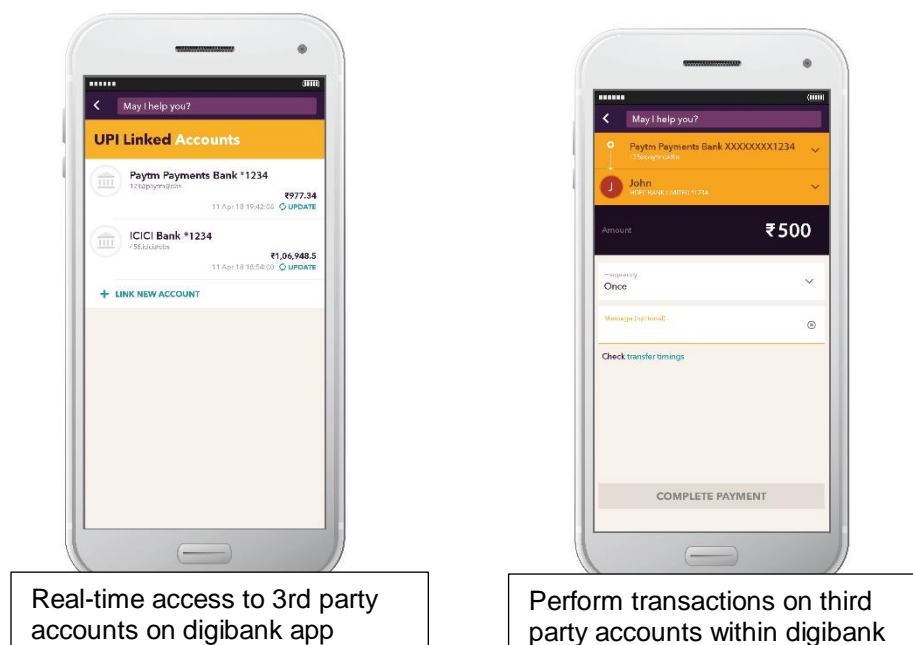


Source: DBS Bank

Open Banking

One of the more differentiating features of Digibank India is how it leverages open banking. Using API-enablement and India's Unified Payment Interface (UPI), the bank allows its customers to manage all their accounts held in other institutions through its app. The customers can see real-time balances and even conduct transactions on their external accounts within the app. Users can also pay for their purchases on online portals such as Amazon, directly from their checking account.

Figure 5: Open Banking Screenshots

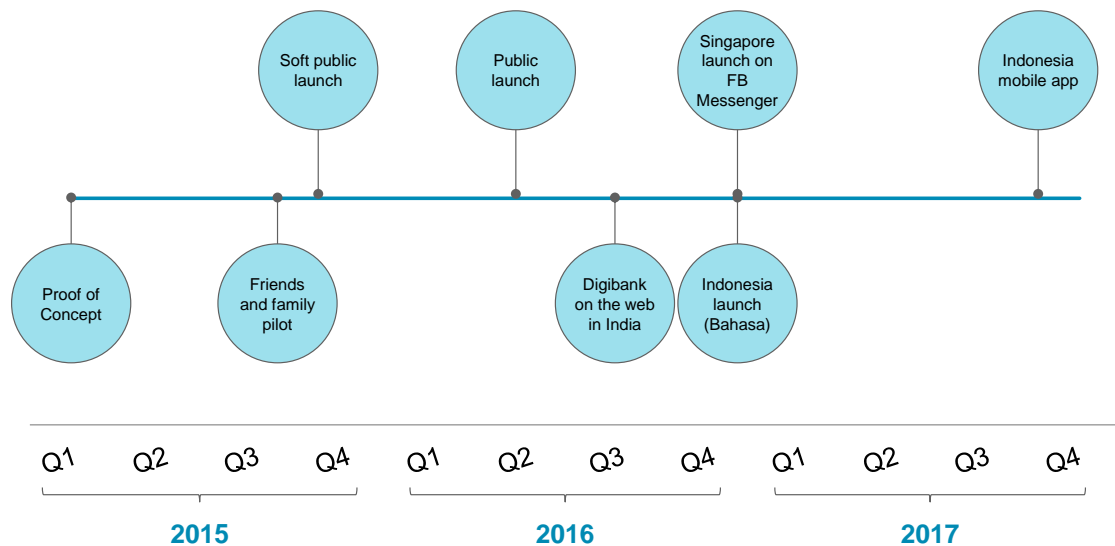


Source: Digibank

Implementation

In total, launching digibank took around 14 months from PoC in February 2015 to go-live in April 2016. DBS Bank extended digibank to Singapore and Indonesia through the second half of 2016 and 2017.

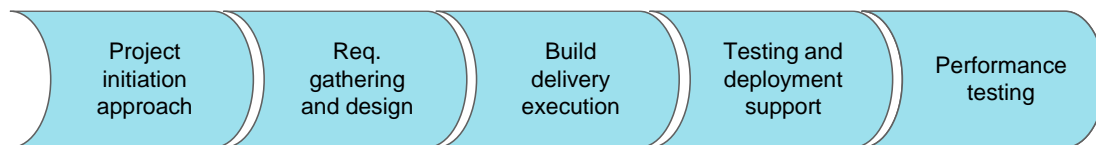
Figure 6: digibank Development Timeline



Source: DBS Bank

The implementation team included the DBS CST Finacle Team of four people, the DBS Digital Banking team of 100+ (including supporting from vendor partners like Kasisto, SOI, Kony, MoneyThor, Euronet, and others), and an Infosys team of four people.

Each phase of deployment was divided into multiple stages:



Infosys Finacle: The core platform for Digibank

With Digibank, DBS wanted to build a true digital bank – a bank that would be digital to the core. Being new to the Indian market, it was critical to differentiate. The bank decided to reimagine the customer journey and make it completely paperless. To succeed with this digital-first strategy, the bank required a core platform which was:

- Open and enables APIs driven access
- Flexible to empower customers to personalize offerings
- Scalable to support aggressive growth plans
- Automated to keep the operational costs low
- Cloud-ready to meet the aggressive cloud transition plans
- Data-driven for better decision making

The bank relied on the Finacle Core Banking solution which is the core banking solution for the group across 14 countries. The Digibank started with primary banking offering of checking account, deposits and payments. Subsequently, the bank decided to also offer wealth management products – starting with mutual funds.

KAI Virtual Assistant: The AI Foundation of digibank

In a world that's increasingly digital, consumer expectations have never been higher. No technology has been received with more expectation than artificial intelligence, and the promise of voice-enabled conversational AI has the potential to revolutionize traditional financial services. DBS knew that conversational AI was the future, and looked to fully integrate KAI from Kasisto into digibank's customer experience.

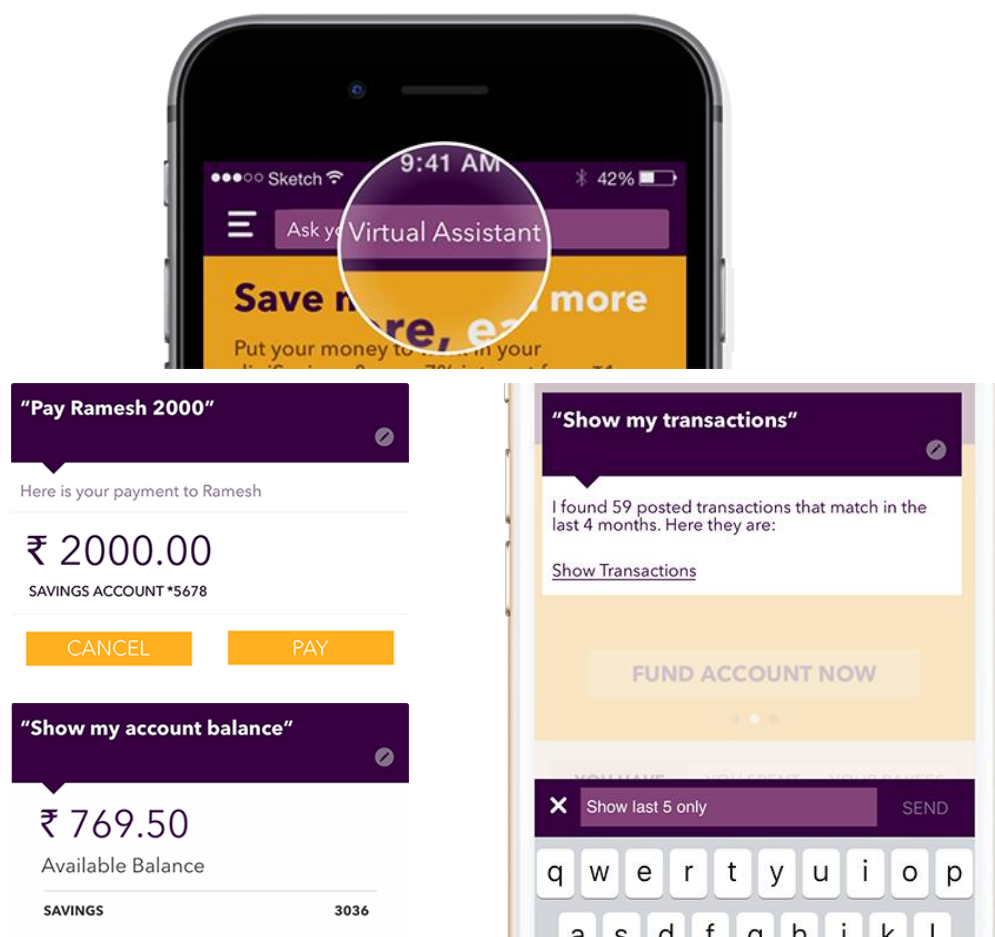
The DBS and Kasisto partnership has resulted in the most comprehensive deployment of conversational AI in the finance industry. DBS views the KAI platform as their "AI brain" and extended the customer experience across geographies, channels (including mobile app, website, and Facebook Messenger), and languages, including English and Bahasa Indonesia. DBS was able to create entirely new banking experiences customized for channels and markets. The goal is to have the KAI-powered assistant be the first touchpoint for most interactions.

To DBS Bank, Kasisto's KAI is the face of digibank. Since the KAI-powered assistant is an expert in banking, the conversations are accurate and contextual — helping customers manage money, track expenses, analyze spending, and improve overall financial literacy and financial well-being. With human language as the user interface, the experience makes banking more interactive and intuitive for customers. Customers simply text the virtual assistant in language as casual as they would text a friend, and it responds as if the customer had a personal banker available 24/7.

Currently, the bot can answer thousands of different questions and handles about 80% of inquiries! The accuracy and performance of the platform ensure that the KAI-powered assistant converses intelligently and delights customers. The assistant's knowledge is constantly growing with KAI's agile platform and self-service tools, which empower DBS to easily add new features and capabilities to the KAI experience.

KAI is tightly coupled with the broader digital transformation strategy of DBS Bank. Envisioning a future of conversational and voice-enabled banking makes Kasisto's KAI a critical piece of the bank's long-term digital and customer engagement strategy to make banking simpler, more convenient, and seamlessly integrated into their customers' lives.

Figure 7: KAI Virtual Assistant



Source: DBS Bank

DBS Bank chose Kasisto based on its expertise in financial services and emphasis on the underlying banking intelligence built into its KAI Banking product. Kasisto is not selling a chat bot, but rather providing an AI-driven omnichannel conversational platform to enable conversations through a mix of text, speech, or other gestures. The company was founded in 2013 as a spin-off from SRI International, the group which created the technology behind Apple's Siri.

DBS Bank worked with Kasisto to identify and design use cases specific to digibank. They also trained KAI on DBS' specific products and services data in order to optimize its capabilities. Because KAI Banking is built for FIs, most of the functionality was available out of the box.

Kasisto provided DBS Bank with APIs for conversations (to support multiple channels such as web, mobile, and Facebook Messenger), backend integration, reporting, and live agent hand-off. This allowed the bank to quickly deploy the virtual AI platform with minimal infrastructure integration effort.

Capabilities

What makes the digibank virtual assistant so successful is the ability to hold "human-like" conversations, understanding the intent as well as the words. In multi-turn conversations, the virtual assistant can infer what the user is *trying* to do. A typical conversation includes six to seven exchanges (i.e., three to four inquiries from the user).

Selected examples of capabilities include:

- Improve financial literacy and user education via a series of FAQs.
- Increase financial well-being with a contextual dashboard.
- Gain access to account information to manage balances.
- Locate transactions by date, merchant, or category.
- Pay person.
- Transfer funds.
- Streamline customer onboarding, self-service, and upsell to deflect live agent calls.

Self-service tools allow DBS Bank to continually customize and create new use cases. The platform's extensibility, language support, and low cost have allowed them to move into new geographies and channels, accelerating customer acquisition and market share goals.

Mixing Human with Machine

With virtual assistants, handling failure is always a crucial aspect to its implementation. No bot will be able to handle every request, and certain conversations are too complex or serious to try to create the use case for virtual assistance. In these instances, KAI hands the customer off to a live agent. Using API integration, customers are transferred from KAI to a human operator using DBS' existing live chat platform, Avaya. The platform uses a set of predetermined rules and inferences to trigger a hand-off, notifying the customer that they will be transferred to a human. During the hand-off, KAI transmits metadata about the interaction and customer issues to ensure a positive customer experience. After the session is completed, the virtual assistant is able to take over again if needed.

All conversations with the virtual assistant are digitally captured, cleansed, and anonymized for the purposes of data mining and compliance audits.

Training the Virtual Assistant







The consumer experience is always improving. KAI uses a combination of supervised and unsupervised learning strategies to tune and train its AI models. It also provides tools to identify new, unseen intents and questions. On the supervised side, KAI Banking has AI training tools that perform continuous intent and slot annotation/evaluation of live systems by subject matter experts.

Unsupervised learning was used extensively to identify new intents via topic modeling tools. DBS Bank uses the Kasisto customer portal to update intents, annotations, taxonomy, and FAQ content to continually improve the user experience and add new features.

Results

According to DBS Bank, digibank powered with the KAI virtual assistant has helped them accelerate the vision of the CEO to create a lifestyle banking brand. Shown in Figure 8, the results have been impressive for the institution. Digibank enhances DBS Bank's reputation as a global financial leader. DBS was named the World's Best Digital Bank by Euromoney Magazine in 2016, and has received numerous accolades around Asia.

Figure 8: Results and Outcomes

Customer acquisition	+1.8 million customers of which...	
	+400,000 are Digisavings Accounts	
Operating Costs	Traditional bank	5     
	Digibank	1 
Customer Experience	80% inquires handled by virtual assistant	
	Account opening in 90 seconds	

Source: DBS Bank

Because digibank is cost effective, operating at a fifth of the costs of a traditional bank, it's quickly able to move into new markets. The virtual assistant makes customer service even less expensive than other similar offerings.

Future Plans

With digibank, DBS Bank has been able to continue to differentiate itself vis a vis the competition. Digitization has been the strategy for DBS Bank to expand its footprint and gain market share across its key markets in Asia. Going forward, the Bank hopes to step up its participation in ecosystems, continue to improve the customer journey and use data to inform its offerings. It will also be adding more activities to digibank around lending and wealth management. DBS Bank also wants the KAI virtual assistant to offer more use cases (e.g. inquiries to serve corporate banking or wealth).

DBS Bank is widely known around the industry as a forward-thinking institution with a clear long-term digitization strategy. With digibank, DBS Bank further expands its capabilities and offerings in the space, creating a completely digital, API-driven, AI-enabled bank with modern functionality and an innovative design. DBS Bank with digibank is truly a model for innovation in digital banking.

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