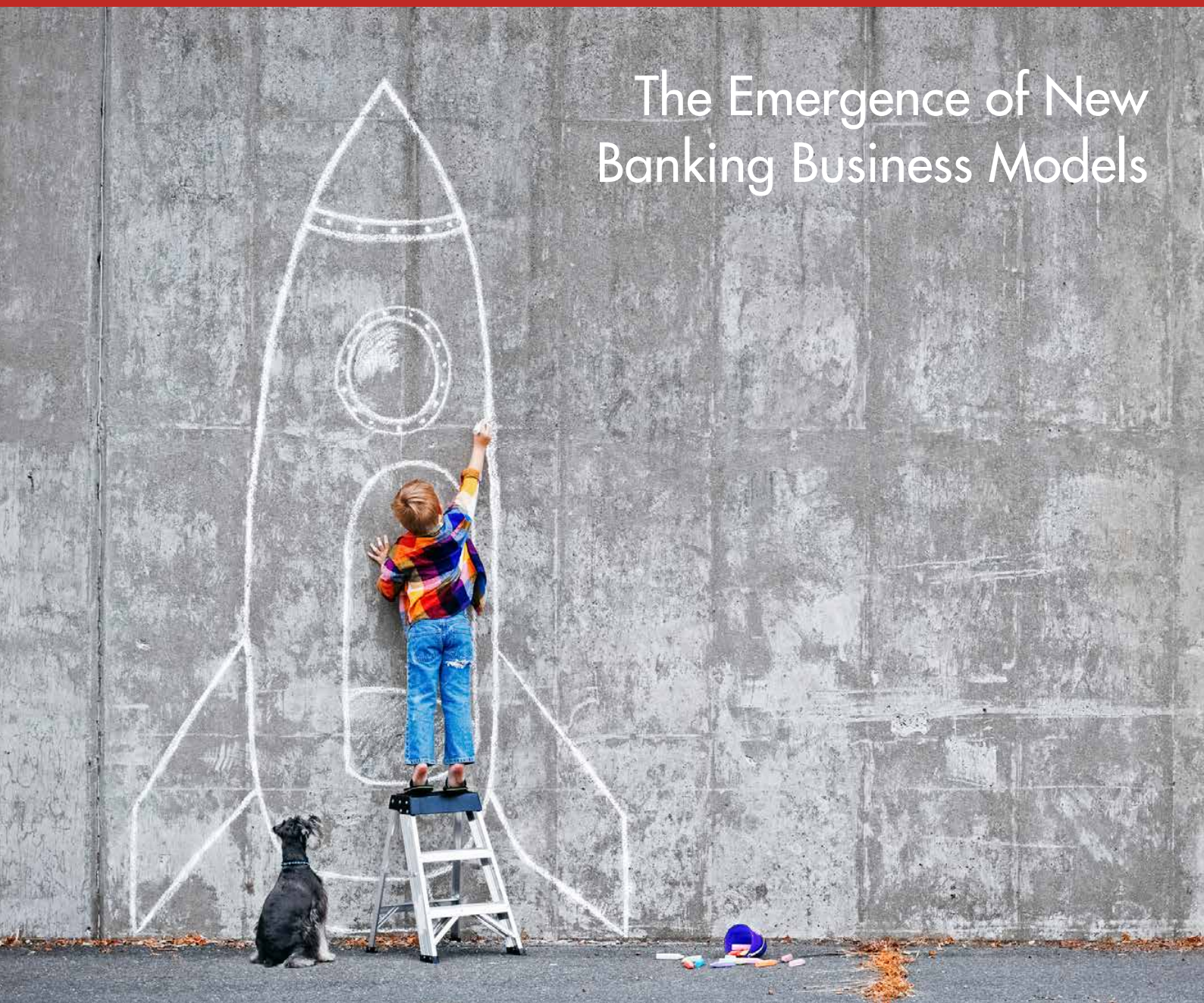


Innovation in Retail Banking

October 2016, 8th Annual Edition

The Emergence of New
Banking Business Models



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Preface

Efma and Infosys Finacle are proud to present the eighth annual study of innovation in retail banking. The theme of this year's study is the emergence of new banking business models and how disruptive technologies are driving the latest developments in the industry.

We are seeing a continuation of recent innovation trends with banks making innovation a strategic priority and investing more to boost their innovation performance and counter threats from new players. While start-ups can be one of those threats, working in partnership with innovative start-ups has become a well-established strategy over the past couple of years.

Disruptive technologies are helping to accelerate the digitalization of banking and also to spur changes to banking business models. We are only just starting to see the impact of these and expect that the changes will accelerate over the next 2 to 3 years. We are already seeing a large number of start-ups and established banks launch digital only banks which can operate off a much lower cost base and provide a very different customer experience.

Regulators are also pushing for changes in the industry and are forcing the pace for the development of open APIs. These will allow new players to develop innovative services and again force banks to consider their business models. The good news is that banks are responding and more are opening innovation labs and investing in research and development.

Our study is a global study and it is striking that developments are so similar across the world. Of course there are differences in some emerging markets where infrastructure is less well developed and hence the focus is on innovation in mobile payments and basic banking services, often led by mobile operators as well as banks. Nevertheless, there are interesting examples of disruptive technologies being deployed in these markets such as machine learning in credit scoring applications.

Finally, we would like to thank all the banks who participated in the innovation survey and who agreed to be interviewed for the study. These insights are invaluable and we hope that our readers find the study to be of practical use.



Vincent Bastid
CEO,
Efma



Sanat Rao
Chief Business Officer and
Global Head of Infosys
Finacle, EdgeVerve

Executive summary

A combination of factors is leading to the development of new business models in banking – disruptive digital technologies are emerging and being deployed in real applications, and innovative start-ups are transforming all different aspects of retail financial services. Threats to established players are coming from multiple sources but most banks are responding with more investment in innovation and in technologies like artificial intelligence. They are also partnering with innovative start-ups, or acquiring innovative start-ups. The trends we have observed are consistent around the world hence banks should have a global perspective when considering innovation trends and developments.

Focus on innovation continuing the recent trends

A majority of banks (74%) say that they have an innovation strategy which is around the same level as last year. However, innovation investment is not increasing as much as it was with only 78% of banks saying they are increasing innovation investment compared to 86% last year.

Most banks (69%) believe they are becoming more innovative, although the self-assessed innovation performance scores by area and overall have more or less plateaued. At the same time there is room for improvement – for example only about a quarter of banks believe their innovation performance is high.

The trend to work with innovative start-ups is growing. Over 40% of banks say they work with start-ups as suppliers and around 30% of banks are investing in start-ups or working with start-ups in accelerators/incubators.

Innovation and digital transformation closely linked

As a strategy for supporting digital transformation, a growing number of banks, around 20%, are now launching or considering launching a digital bank as a parallel bank to the existing operation. A small minority of around 5% are also acquiring or considering acquiring a digital only banking business.

For those banks launching digital only banks, 85% will have different products and services, and 81% will have different channel applications and back office technology and processes from the core bank. The vast majority will use the same banking license as the parent company.


The priorities for banks in their digital transformation are creating a customer-centric organisation (for 78% of banks), enhancing channels to give an omnichannel digital experience (for 74% of banks), and maximising usage of mobile and social technologies (for 68% of banks).

The biggest barrier to digital transformation is the legacy technology environment according to 50% of banks. The lack of a unified vision for digital is considered a barrier by 44% of banks, and the lack of skills and experience is considered a barrier by 38% of banks.

Disruption threats high but not increasing

The threat of industry disruption from technology companies is believed to be high by 48% of banks. A similar number, 47%, perceive the threat from start-up challenger banks to be high. Overall, the threat level from new competitors is perceived to be similar to last year.

The most disruptive technologies for the industry are believed to be advanced analytics and big data, open APIs, and artificial intelligence. Most banks say these are having a significant impact now or will do over the next 2 years except for artificial intelligence where the impact is likely to take longer.



Blockchain/distributed ledger technologies are expected to have an impact by fewer banks (only 47%) and over a longer time. Internet of Things is expected to have a significant impact by only 38% of banks.

In order to access these technologies, 74% of banks say that working with innovative start-ups as suppliers or partners is of high relevance. Also of high importance is internal research and development according to 46% of banks.

Convergence of innovation trends and developments across regions

Banks in low income countries are lagging in terms of their adoption of an innovation strategy but more are increasing investment in innovation than banks from middle or high income countries. They are also less concerned about the impact of disruptive technologies and are therefore unlikely to be currently focused on working with technologies like open APIs or artificial intelligence.

It is very clear that common developments are taking place in all parts of the world with the launch of digital banks, alternative lenders and various kinds of payment systems. This is happening in countries ranging from the United States to Brazil, China, Australia and South Africa. How these developments are taking place does vary to some extent, with technology and e-commerce companies taking a lead in China for example.

Innovation case studies and examples

The following is a list of the case studies and examples which are described in the report.

Alior Bank	Poland	Setting up of an innovation lab to enhance the bank's innovation capabilities.
Bradesco	Brazil	Innovation strategy, digital transformation and approach to new technologies.
Branch International	US/Kenya	Start-up which has developed a lending business based on credit scoring from mobile phone use.
Capital One	US	Opening up of the banking platform for developers to work on propositions using open APIs.
Credit Mutuel Arkea	France	Use of blockchain/distributed ledger technology for KYC.
DBS Bank	India	Launch of a digital only bank in India using artificial intelligence for customer service.
Deutsche Bank	Germany	Development of innovative propositions and approach to new technologies.
DnB NOR	Norway	Digital transformation strategy and the impact on branches.
Emirates NBD/ICICI Bank	UAE/India	Use of the Edgeverve Blockchain Framework for a cross-border remittance and trade finance pilot.
Kreditech	Germany	Start-up which has developed a consumer lending business based on advanced credit scoring.
Orange	France	Development of a range of mobile money and mobile banking services in multiple countries.
Paytm	India	Plans for launch of a payments bank in India, following investment by Ant Financial of China.
RBS	UK	Implementation of an artificial intelligence system to support relationship managers.
Santander	Spain	Introduction of Ripple's blockchain technology to facilitate international payments.
solarisBank	Germany	Creation of an API-accessible banking platform for the needs of the digital economy.
Standard Chartered	Singapore	Setting up of an innovation lab to enhance the bank's innovation capabilities.
UniCredit	Italy	Setting up of a US\$200m corporate venture fund in partnership with Anthemis, a VC firm.
UniCredit	Italy	Creation of a digital only bank in Italy called buddybank.
ZestFinance	US	Development of an advanced credit scoring business and partnership in China with Baidu.

Introduction

When we first launched the Innovation in Retail Banking study in 2009, the industry was in a precarious financial position and survival was still more important than developing new growth opportunities and digitalization. It is also worth remembering that in 2009, annual global smartphone shipments were just 174 million units, which compares to 1,400 million units in 2015. The number of mobile broadband connections has increased from less than 1 billion in 2009 to around 8 billion in 2015.¹

Global banking profits have more than doubled from a low point of US\$494bn in 2009 according to McKinsey & Co,² and the focus on innovation has increased dramatically. Most of the larger banks, and many smaller banks, have innovation teams, and are investing in innovative start-ups or working with accelerators/incubators.

To some extent the innovation agenda has become intertwined with the digitalization agenda, although digitalization is a much broader topic which also involves transforming core processes. The level of investment in digitalization is substantial. For example, UniCredit is investing EUR 1.2bn over 3 years (2016-18) in digital transformation, including continued transaction migration, digitalising and simplifying back-end processes, digitalising document management, digitalising end-to-end sales processes, developing a new digital core banking system, and launching new digital businesses like buddybank (see also page 57).³

Innovation in channels continues to be the most important focus for banks (particularly mobile) and the impact it is having on the switch to digital channel usage is clear. This is happening around the world. A good example is Bradesco, one of the leading banks in Brazil, which reported that the number of active mobile channel users increased from just a handful in 2011 to 7.9m in March 2016, exceeding the number of active Internet channel users.

Threat of disruption

The development of digital technologies is, however, also providing opportunities for new entrants in the retail banking market. The threat of disruption is perceived to be high by banks, and is increasing. The biggest threat is expected to come from technology companies and start-up challenger banks whereas retailers and insurance companies are no longer perceived to be a significant threat (see Figure 1). Overall, 77% of banks believe that the threat is high or very high from at least one group of potential competitors.

Payments and mobile wallets (which are linked to payments), are the areas where emerging competitors are expected to have the most impact (see Figure 2). A large majority of 86% of banks believe that emerging competitors will have a significant impact in the payments area. Other product areas like savings, insurance and investments are where banks expect the impact of emerging competitors to be the lowest.

¹ Ericsson Mobility Report, June 2016

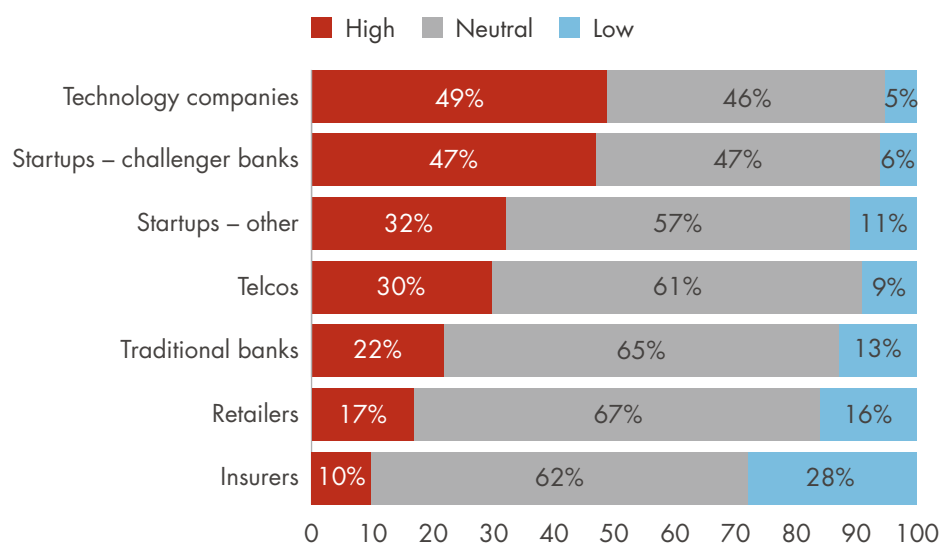
² Asia-Pacific Banking Review 2016, McKinsey & Co, June 2016

³ UniCredit Annual Report 2016

Figure 1: Threat of industry disruption

Proportion of banks scoring High, Neutral or Low

Using a scale of 1 to 7, the categories are High (6 or 7), Neutral (3, 4 or 5), Low (1 or 2)



Source: Efma-Infosys Finacle Innovation Survey 2016

For this year's survey, we separated start-ups which are challenger banks from other types of start-ups (which are principally in lending or payments). These are all described as FinTechs, although note that the term FinTech can also apply to companies providing services to banks like credit scoring or identity verification. Equity investment in venture capital backed FinTech companies has been growing strongly in recent years, reaching US\$14.5bn in 2015. Investment remains quite high but there are signs that the quarterly investment rate is slowing - the amount was just US\$2.5bn in Q2 2016 according to KPMG and CB Insights.⁴

We highlighted in last year's report that one of the responses by banks to the threat of disruption has been an increasing willingness to work with FinTechs in different ways. A good example is ING from the Netherlands. According to Ralph Hamers, CEO of ING Group: "We actively monitor advances in the FinTech space and are able to respond quickly to opportunities that have the potential to improve the customer experience. We are currently partnered with around 45 FinTechs dedicated to creating innovative solutions for banking needs, such as money management, payments, lending and mobile on-boarding."⁵

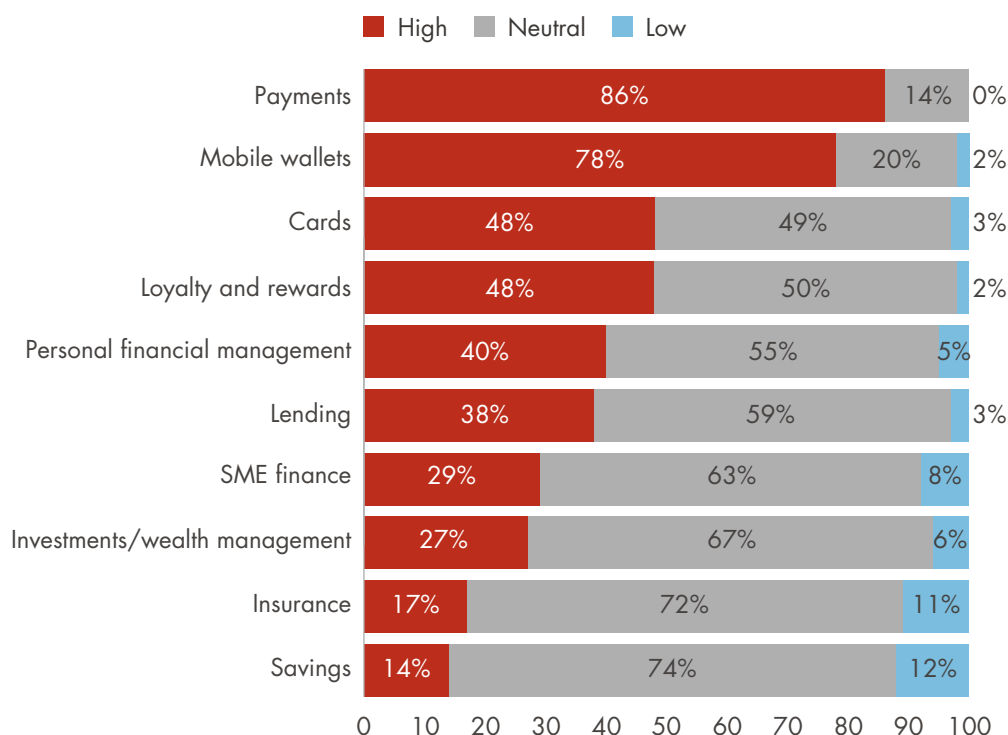
⁴ The Pulse of FinTech Q2 2016, KPMG International and CB Insights

⁵ ING Group Press Release, May 2016

Figure 2: Impact of emerging competition

Proportion of banks scoring High, Neutral or Low

Using a scale of 1 to 7, the categories are High (6 or 7), Neutral (3, 4 or 5), Low (1 or 2)



Source: Efma-Infosys Finacle Innovation Survey 2016

The challenge from technology companies

We use the term technology company to cover a broad range including companies which are involved in search, e-commerce, social media and mobile. In some cases, the larger technology companies do a range of things so it is difficult to categorise them exactly (e.g. Google, Facebook or Apple). The interesting thing is that in the larger developed markets, these companies have not directly entered the retail banking market. Some are making initial steps in payments and could yet have a disruptive influence there, but so far progress has been slow.

In contrast, in countries like China and India, the technology companies are starting to have a big impact on retail financial services. Alibaba in China is perhaps the best example, having set up Ant Financial Services which at the end of 2015 had the following services:

- Payments – 451m active users
- SME loans – 3m cumulative loans
- Wealth management – 15m active users
- Insurance – 380m cumulative policies
- Credit referencing – 130m cumulative users

Ant Financial Services raised US\$4.5bn in investment in April 2016, and plans to have an Initial Public Offering later in 2016. The company has also invested in the Indian mobile payments and commerce company, Paytm (see below).

CASE EXAMPLE

Paytm

Paytm was launched in 2010 and is India's largest mobile payment and commerce platform. Paytm is also a leading payment solutions provider to ecommerce merchants using its RBI approved semi-closed wallet. The company is the consumer brand of One97 Communications. In a significant development, Alibaba's Ant Financial Services invested US\$500m in One97 during 2015, acquiring a 25% stake in the company.

With a user base of more than 126 million in 2016, Paytm is on a mission to bring half a billion Indians to the mainstream of the economy using mobile payment, commerce and soon to be launched payment banking services. Customers can use the Paytm wallet to shop or pay for a whole range of other services on their mobile phones including phone recharge, bill payments, travel tickets, and hotels.

The company successfully applied for a payment bank license from the Reserve Bank of India, and intends to launch the new bank in 2016. The objective behind the introduction of payments banks is to widen the reach of banking services and push the government's goal of financial inclusion. The new category of banks will provide basic savings, deposit, payment and remittance services to people without access to the formal banking system, but will not be allowed to lend. The payments banks will target financially excluded customers like

migrant workers, low-income households and micro businesses. A total of 11 companies were given provisional licenses to open payment banks, which should bring more competition to the banking industry in India.

Paytm's new payments bank will have the following features:

- Modern API driven solutions will enable Paytm to integrate its payment bank services rapidly across its existing wallet business.
- Readymade integration adaptors, along with its compliance to industry standards, will reduce integration costs as well as simplify Paytm's banking transformation journey.
- The product factory capability will enable Paytm to easily create and offer a comprehensive range of current account and savings based products and services.
- The solution offers integration adaptors with many third party applications like Anti-Money Laundering, which will enable the Paytm payment bank to become operational rapidly
- Proven scalability will allow Paytm to easily meet future growth needs and seamlessly manage expansion in the scale of its operations

The challenge from challenger banks

We have been talking about new banks like Moven and Simple for the last few years but there is now a whole range of challenger banks entering the retail banking market.

The terminology “challenger” can cover different types of competitor, some of which are not particularly new. KPMG has produced a useful overview of challenger banking in the UK which identifies 4 different types of challenger⁶:

- Large challenger (e.g. Virgin Money)
- Small challenger (e.g. Metro Bank)
- Digitally focused challenger (e.g. Atom Bank)
- Retailer (e.g. Tesco Bank)

Just a couple of digitally focused challengers had launched limited services as of August 2016 in the UK e.g. Atom and Mondo, but several more are preparing for launch in 2016 and 2017.

Starting a digital only challenger bank is less costly than starting a multichannel bank but still requires a substantial investment, and takes time. Number26, which we featured in last year’s report, has received around US\$53m of investment up to July 2016. The company was founded in February 2013 and launched in January 2015 on the back of the banking license of Wirecard Bank, in Germany. In July 2016, Number26 received its own banking license and had achieved a customer base of 200,000 customers. Atom Bank in the UK has received even more investment, approximately US\$160m, and launched a single fixed saver product in April 2016, two years after being founded.

The challenge from telcos

The threat of industry disruption by telcos has been around for some time. Services like M-Pesa in Kenya were the first to make an impact and, according to the GSMA, at the end of 2015 there were 271 mobile money services in 93 countries, with a total of 134m active accounts.⁷ Most of these are telco owned or controlled. Although progress has been dramatic in the past 10 years, the growth rate in the number of services has actually been falling and in many countries the focus is now on achieving interoperability between services to drive up usage.

⁶ A New Landscape: Challenger Banking Annual Results, KPMG, May 2016

⁷ 2015 State of the Industry Report – Mobile Money, GSMA, April 2016

In developed markets there is a mixed picture. Mobile money services launched in countries like the United States and United Kingdom have had limited success. However, there are successful examples of partnerships between telcos and banks in Poland: T-Mobile/Alior Bank and Orange/mBank. In Germany, Telefonica has announced it is launching a new service with Fidor Bank. Orange provides one of the best examples of a comprehensive and far reaching financial services strategy from a telco, covering both developed and developing markets (see below).

CASE EXAMPLE

Orange

Orange provides a very good example of a telecommunications operator which is developing in financial services, and competing with traditional banks. The company has three approaches it uses in different countries depending on the market situation and opportunity:

- Orange Cash: Mobile payments using contactless payment through NFC technology in Europe with applications launched in Spain and further developed in France.
- Orange Money: In Africa and in the Middle East, Orange aims to reach 30 million users with its money transfer and payment services by 2018. In 2015, the number of Orange Money customers grew by 31% year on year, for a total of more than 16.4 million users.
- Orange Finance: Building on the success of the mobile bank Orange Finanse in Poland (in partnership with mBank) Orange is acquiring control of Groupama Banque in France and launching a mobile bank in France, Belgium and Spain.

The acquisition of 65% of Groupama Banque is the latest demonstration of the strategy. According to Stéphane Richard, Chairman and CEO of Orange: "This agreement is a major step forward in our ambition to diversify into mobile financial services." The company will be renamed Orange Bank, and will launch a banking service specifically designed for mobile usage in France at the beginning of 2017. This service will be marketed under the Orange brand within Orange's own distribution network and under the Groupama brand within Groupama's distribution networks.

Through Orange Bank, Orange and Groupama will offer all essential banking services over a platform that provides customers with a unique digital experience on their mobile phones. The services proposed will cover current accounts, savings, loans and insurance services, as well as payment. The combined ambition for the two groups is to attract over two million customers in France.

The emergence of new business models

The range of challengers to established banks described above illustrate the new business models that are emerging in banking. The digital technologies being deployed are impacting every aspect of a bank's business including for example sales processes, credit scoring, onboarding of customers, security management and customer service. There are also now innovative ways to integrate third party services. When all of these are combined, a new business model can be created which can provide a better customer experience (if done well), at a lower cost.

In the next section of the study, Section 1, we will look at innovation trends, building on the research we have been conducting for the past 8 years. In Section 2, we will review some digitalization trends and the link to innovation. Digitalization is a big part of the innovation taking place across retail banking. However, there are specific technologies which are either currently driving or enabling developments, or are expected to do so soon, including open APIs and artificial intelligence. In Section 3 we will look at the likely impact of these new technologies, and in Section 4 we will look at examples of their application. Our survey and study is global in coverage and so, in Section 5, we review the differences and similarities between the regions of the world.

To illustrate the trends taking shape, we have interviewed 5 banks or start-ups and these cases are described in Section 6 (in alphabetical order):

- Alior Bank, an innovative bank from Poland which was set up in 2008 has now opened an innovation lab to focus its research and innovation investment in new areas like artificial intelligence.
- Bradesco, one of the leading banks in Brazil, has a wide ranging innovation program working with start-ups and with industry leaders on emerging technologies.
- Deutsche Bank, a significant retail and SME banking player in several markets, has invested to introduce new digital propositions and work on disruptive technologies.
- Kreditech, an innovative start-up from Germany, is using advanced analytics and big data (including machine learning) to build a consumer finance business in emerging markets.
- UniCredit, one of the largest and most international of retail banks, has invested in setting up a digital bank in Italy which adopts a different business model from the parent bank.

Interview with the author

Michael Pearson is a strategy, innovation and corporate development expert with over 30 years' experience working for and advising financial institutions around the world. He previously ran an innovation and new ventures group within a major UK bank and is an experienced investor in financial services and financial technology ventures. Michael has been the author of the Innovation in Retail Banking study since its inception in 2009.

What are the most notable changes you have seen since the first study?

Even before the financial crisis of 2008/09, there was relatively limited interest in innovation at banks around the world. Revenue growth was reasonable and there were options for mergers and acquisitions in order to grow. The turning point seems to have been around 2011 when forward thinking banks started to realize that new digital technologies would have a big impact on the industry, and more innovation investment was needed to boost growth.

There has been a lot of resistance to setting up innovation teams, because many bankers feel that innovation needs to be part of everyone's job, but there has been a realization that some innovation activities need to be centralized and coordinated in order to be effective. It is also very noticeable that we are now seeing similar approaches to innovation in all parts of the world.

What are the biggest innovation challenges for banks?

The biggest challenges we continue to see are technology and culture. In general, banks have under-invested in their IT systems over a long period of time and many have still not been able to make the transition from old legacy systems. The number of inter-connected systems is also a big problem when it comes to developing new products and services.

From a culture perspective, it is just not possible to create a start-up like culture in a bank and hire the same sort of people as start-ups do. Regulation and compliance continue to be critical factors in banks and the compliance culture is also very important for long term success. Bank failures are often due to problems with risk management or cost management, not from a lack of innovation.

What are your predictions for the future of innovation in banking?

The technologies are there to radically change the way we bank but it will take some time for them to work their way into the mainstream. Although there are lots of very innovative start-ups out there, I don't expect any dramatic changes in the short to medium term in the industry structure in most countries.

Many banks have reacted well to the threat and are able to copy what start-ups are doing, or partner with them. Start-ups are actually shifting more to a B2B strategy from B2C, which is what happened in 2000 and 2001 toward the end of the first Internet boom. However, I expect some banks will not see much success with their innovation initiatives and within a couple of years they will be closed down or radically re-structured.

1 Innovation trends

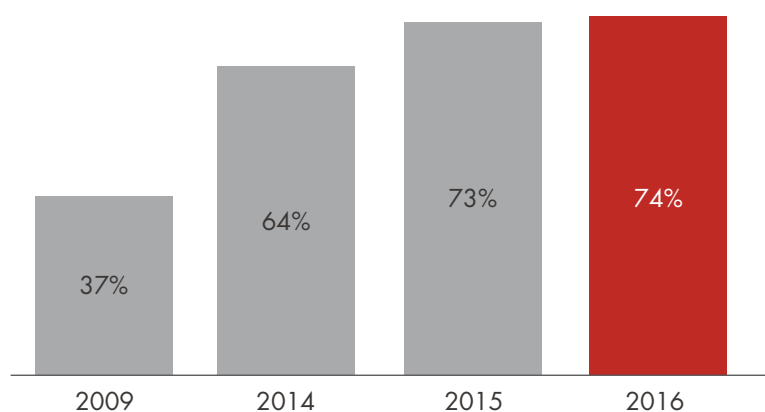


Innovation trends

According to our survey, the proportion of banks with an innovation strategy has increased marginally in 2016 to 74%. This is much higher than the level of only 37% in 2009 but it appears that the increases we have seen since then are now levelling off (see Figure 3).

Figure 3: Innovation strategy

Proportion of banks with an innovation strategy

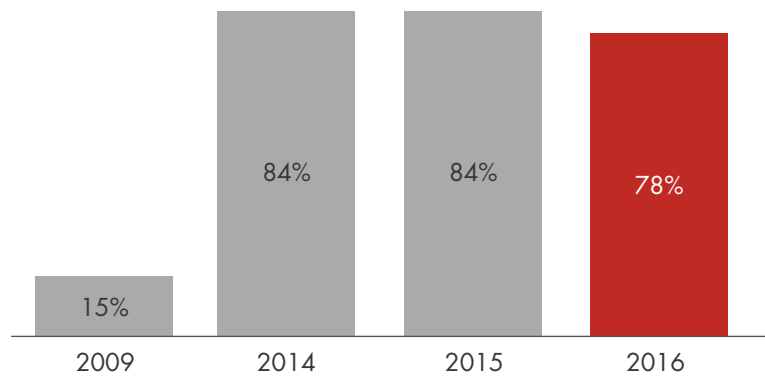


Source: Efma-Infosys Finacle Innovation Surveys 2009 to 2016

The proportion of banks increasing innovation investment each year has also increased dramatically since 2009 but in 2016 we have seen the first decline in this measure (Figure 4). The proportion has dropped from 84% in 2015 to 78% in 2016. This perhaps reflects the more challenging financial environment facing many banks going into 2016, with falling commodity prices, a slowdown in key emerging markets like China, and continuing low interest rates. However, the fact is that most banks are increasing their innovation investment. Good examples are Alior Bank which has opened an innovation lab in Poland (see page 50) and Standard Chartered which has opened an innovation lab in Singapore (see page 20).

Figure 4: Innovation investment

Proportion of banks increasing innovation investment compared to previous year

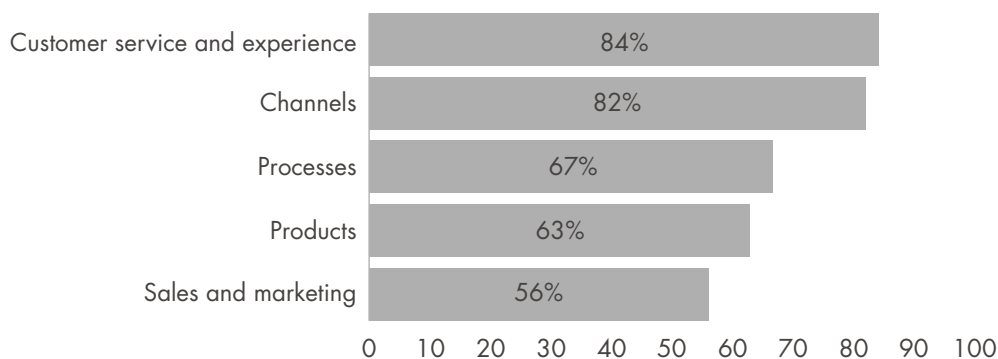


Source: Efma-Infosys Finacle Innovation Surveys 2009 to 2016

The areas where most banks are increasing innovation investment are customer service/experience and channels (see Figure 5). These areas are of course to some extent linked as new channels like mobile can deliver improved customer experience. For the first time in our survey, products has dropped below processes on this measure of increasing investment.

Figure 5: Innovation investment by area

Proportion of banks increasing innovation investment compared to previous year by area



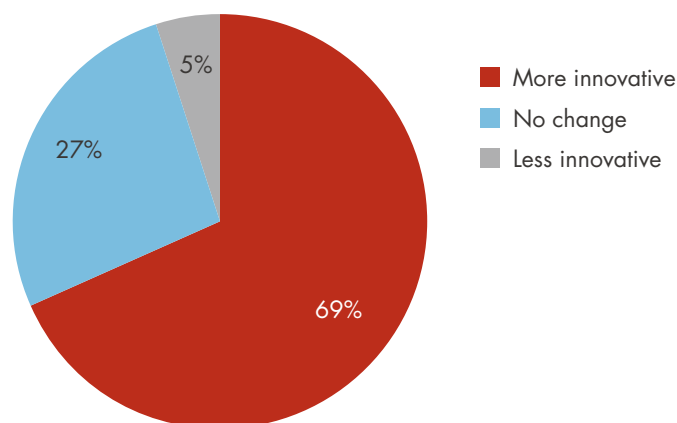
Source: Efma-Infosys Finacle Innovation Survey 2016

The majority of banks (69%) believe they are becoming more innovative (see Figure 6). This is a very similar result to last year's survey and indicates that the investments being made in innovation are to some extent having an impact. Only a handful of banks feel they are becoming less innovative.

However, there is plenty of room for improvement (see Figure 7). A total of 50% of banks regard their innovation performance in channels as high (scoring 6 or 7 on a scale of 1 to 7). In all other areas, less than one third of banks feel that their innovation performance is high.

Figure 6: Innovation performance

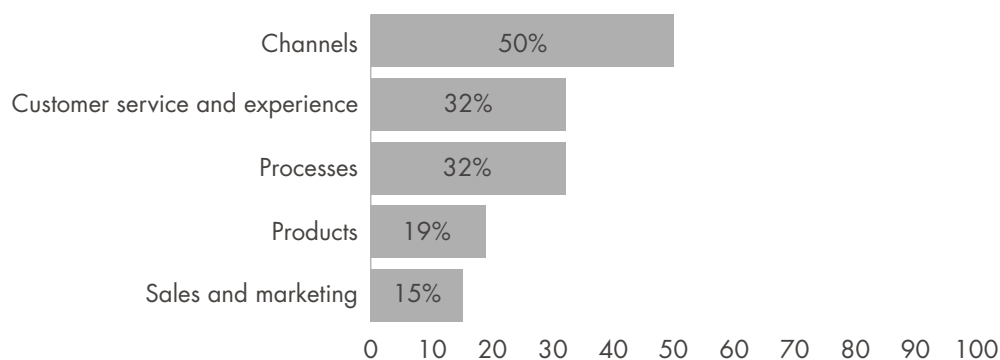
Proportion of banks becoming more or less innovative (self-assessment)



Source: Efma-Infosys Innovation Survey 2016

Figure 7: Innovation performance by area

Proportion of banks scoring High, where High is a score of 6 or 7 on a scale of 1 to 7 (self-assessment)



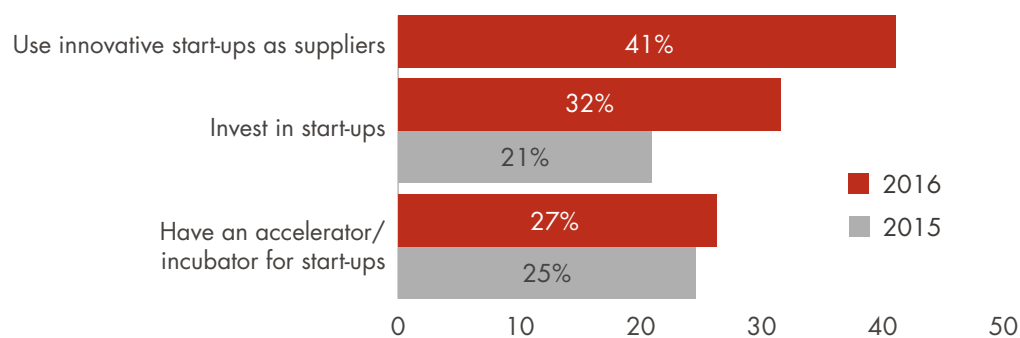
Source: Efma-Infosys Finacle Innovation Survey 2016

Last year's study focused on the issue of how banks are working with innovative start-ups to boost their innovation performance. The trend to work with start-ups (or FinTechs) is continuing as illustrated by Figure 8:

- 41% of banks are working with start-ups as suppliers. A good example is Santander's international money transfer service with Ripple (see page 41).
- 32% are making investments in start-ups, ad-hoc or through a fund. UniCredit is one of the latest banks to set up a corporate venture fund to invest in FinTech (see below).
- 27% are running accelerators or incubators, internally or externally. A good example is Bradesco which has a program called inovaBRA (see page 52).

Figure 8: Working with start-ups

Proportion of banks working with or investing in start-ups



Source: Efma-Infosys Finacle Innovation Survey 2016

CASE EXAMPLES

Standard Chartered

In March 2016, Standard Chartered announced the opening of a new innovation lab in Singapore. This complements an existing technology outpost of the bank in Silicon Valley. Named eXellerator, the lab is a dedicated space to explore the use of emerging technologies (such as distributed ledger) and expedite the implementation of digital solutions to deliver value to customers. The lab will employ 15-20 people and has the support of the Monetary Authority of Singapore. It is based in the regional head office building of Standard Chartered.

According to Anju Patwardhan, Global Chief Innovation Officer: "Singapore's strategic location at the heart of the ASEAN region and its vibrant FinTech ecosystem makes it the logical location for the Bank to base our new global innovation lab. This is where we

can tap the depth of knowledge and talent, as well as work with local universities and research organizations, to help drive the Bank's innovation agenda. Through our new innovation lab, we will be exploring the use of emerging technologies, data science solutions and new ways of working as a means to better customer experience and business benefits."

In another example of Standard Chartered's commitment to innovation and emerging technologies, the bank has signed a multi-year collaboration agreement with A*STAR's Institute for Infocomm Research (I2R) – Singapore's national information and communications technology research institute – to jointly work on data science research and experimentation by leveraging the institute's vast network of world-class data scientists and software engineers.

UniCredit

In March 2016, UniCredit announced the setting up of a joint investment venture with Anthemis Group, to be called UniCredit evo. The venture will have an initial capital commitment of US\$200m and will target investments in financial technology start-ups. UniCredit's aim is to collaborate with emerging players within the FinTech ecosystem and explore, sustain and develop cutting-edge technologies and solutions.

London-based Anthemis Group, founded in 2010, is a venture investment and advisory firm at the centre of a vibrant ecosystem of startups and financial institutions dedicated to reinventing financial services for the digital world. Anthemis is already an investor in start-ups like Atom, Azimo and Fidor.

According to Paolo Fiorentino, COO of UniCredit: "Thanks to this partnership, we are ramping up our digital transformation, building a new business model to maximize the combined strengths of traditional market players and newcomers. As a bank we have the resources, financial expertise and large customer base that can complement startup innovation. This will in turn boost our digitalization, enabling us to better adapt to the ever-evolving needs of our customers. Today, Anthemis becomes a key partner on this journey. By leveraging their wide expertise, Anthemis will help us identify top class players and opportunities that will drive innovation and ultimately help us to better serve our customers."



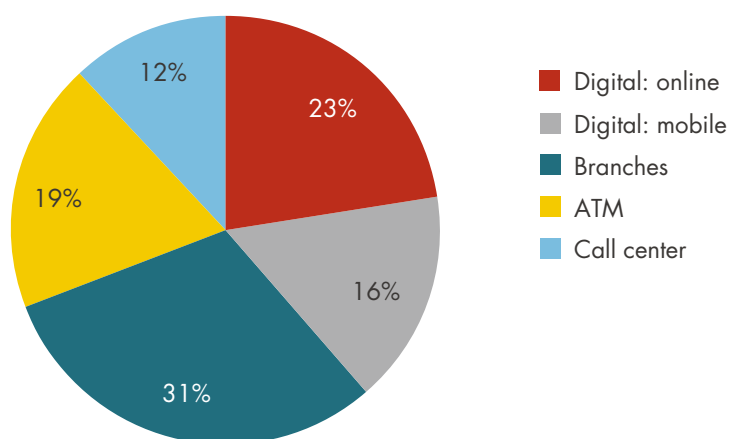
2 Innovation and digital transformation

Innovation and digital transformation

The shift of transactions from branches and call centers to digital channels has been a long term trend and has accelerated with the introduction of mobile banking on smartphones. According to our survey, taking just the multichannel banks who responded, around 39% of transactions are now in either the online or mobile channels, compared to just 31% through branches, 19% through ATMs and 12% through call centers (see Figure 9). A small number of banks are reporting a very low level of transactions through social networks or wearables, but we expect this to increase.

Figure 9: Transactions by channel

Proportion of transactions in each channel reported by banks



Source: Efma-Infosys Finacle Innovation Survey 2016

These are, of course, only approximate averages on a global basis and in some cases the transition has already gone much further. In Denmark, Danske Bank has been a leader in developing mobile banking and payments applications. In the first quarter of 2016, Danske had 17.3m transactions through online banking, 9.2m transactions through mobile banking and just 3.7m transactions through branches.⁸ Hence, the combined online and mobile banking transactions were more than 7 times the level of branch transactions. In addition to mobile banking, Danske Bank has developed a mobile payments app (MobilePay) which is available to the customers of all banks in Denmark and this service recorded 147m transactions in the first quarter of 2016. The case of DnB NOR from Norway also illustrates the shift to digital transactions and the impact this is having on branches (see below).

⁸ Danske Bank Fact Book Q1 2016

CASE EXAMPLE

DnB NOR

DnB NOR is the largest bank in Norway and one of the largest in the Nordic region. Countries in the region have seen a very rapid adoption of online and mobile banking and the impact on the banks is clearly illustrated by developments at DnB.

In February 2016, the bank announced it was closing half of its remaining branches, a reduction from 116 to just 57. This is on top of the decline which had already taken place from the 220 branches in existence at the end of 2010. Hence, there has been a reduction of around 75% in just 5 years.

According to DnB, radical changes in customer behaviour require a new operating model as everything is going digital. About 90% of customers are regular

digital users, whereas only 15% are regular branch users. Of the digital interactions at the bank, about two thirds are now mobile and one third online. Manual branch transactions fell by 80% during 2014 after changes to manual cash-handling in branches. Even so, the bank reports that customer satisfaction increased. Online sales are also booming. Over 80% of mutual fund savings are now sold online, and more products are being set up for end-to-end online sales and fulfilment.

The bank has also launched a new mobile payments service, called Vipps, which is open to customers of any bank in Norway. The service has already been downloaded by 25% of Norwegians and has fundamentally changed the way people make payments.

As a strategy for dealing with digital transformation, approximately 20% of banks are launching or considering launching a digital only bank. A small minority of approximately 5% are acquiring or considering acquiring a digital only banking business.

Recent examples of banks launching digital only banks are UniCredit (Italy) with buddybank (see page 57) and Caixabank (Spain) with imaginBank. These digital only banks are competing with the parent bank in their core retail banking markets. In another example, DBS Bank has launched a digital only bank in India, which is outside of its core retail banking market, hence DBS are using this as a low-cost and flexible market entry strategy (see page 37).

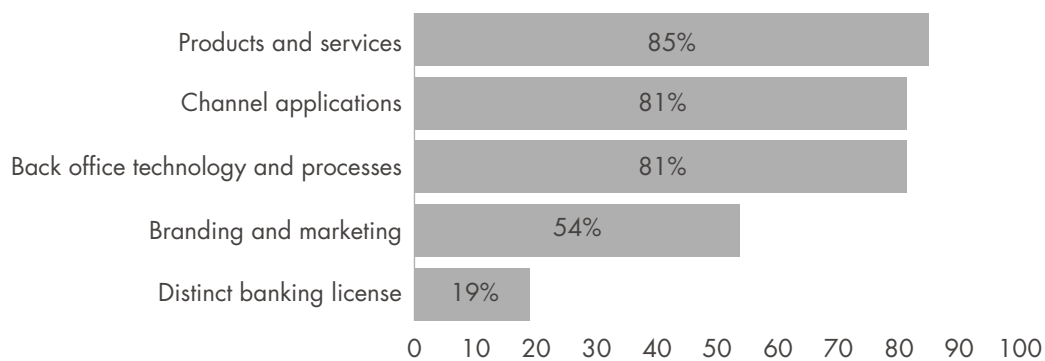
BBVA is continuing its approach of acquiring or investing in start-up digital banks. Following the acquisition of Simple (US) in 2014, BBVA has acquired a 30% stake in Atom Bank (UK), and 100% of Holvi (Sweden). According to BBVA, acquisitions and investments play an important part in providing the digital expertise to deliver the company's plans.

Other banks are joining BBVA with this approach. In July 2016, BPCE of France announced it was acquiring Fidor Bank which operates in Germany and the UK. The bank is still relatively small, with 120,000 customers, but has been a leader in digital and community banking, launching a number of innovative services. According to François Pérol, Chairman of BPCE: "This operation constitutes a key step in the acceleration of the digital transformation of our group. It further demonstrates our commitment to innovation, to developing a customer centric approach enabled by a digital banking technology, and to be more involved in the digital and mobile banking field."

For those banks launching digital only banks, these new banks will mostly have different products and services, channel applications and back office technology and processes from the core bank (see Figure 10). Interestingly, only around half will use different branding and marketing. The vast majority will use the same banking license as the parent company. Launching a new bank enables the parent bank to overcome (at least in this part of the business) the challenges of legacy systems and channel integration, and the lack of agility, which constrain the core bank. One of the objectives for banks like UniCredit in pursuing this strategy is to learn from the experience and transfer, over time, that learning back into the core bank.

Figure 10: Digital only banking differences

Differences from the core bank for new digital only banks



Source: Efma-Infosys Finacle Innovation Survey 2016

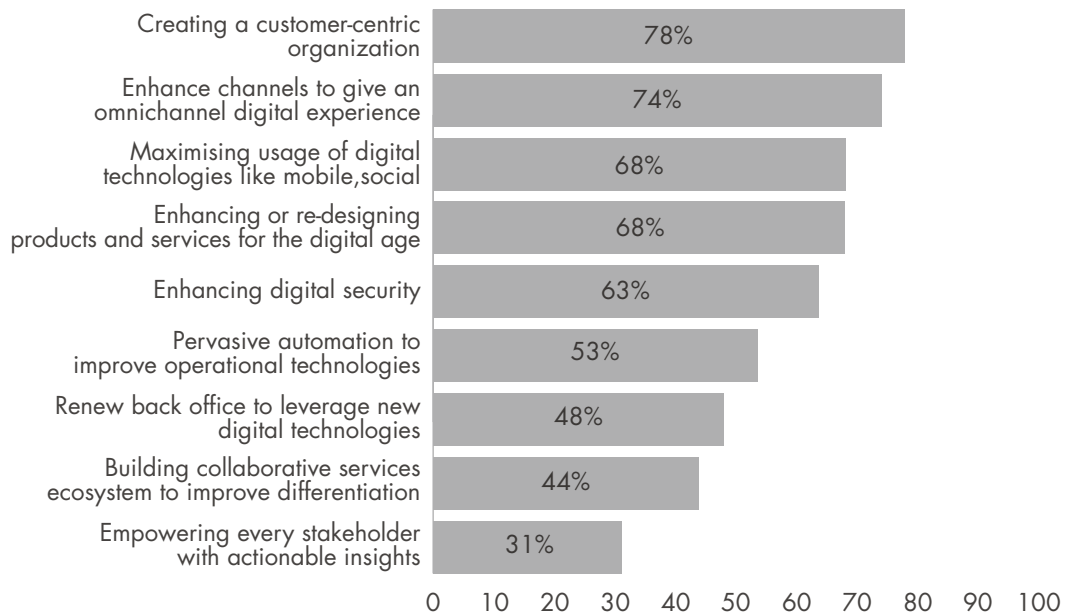
The priorities for banks in their digital transformation are shown in Figure 11. Top of the list are creating a customer-centric organisation, enhancing channels to give an omnichannel digital experience, maximising usage of mobile and social technologies, enhancing or re-designing products and services for the digital age. There is a link between digital channels and customer-centricity because, generally speaking, customer experience is better in digital channels.

Part of the reason for launching digital only banks is to provide this exceptional customer experience without having to link in physical channels to create a seamless omnichannel experience, something which is proving to be a particular challenge with legacy systems. Less important priorities in digital transformation are operational efficiency and empowering all stakeholders with actionable insights.

The biggest barrier to digital transformation is the legacy technology environment (see Figure 12). The lack of a unified vision for digital and the lack of skills and experience are also important barriers for many banks.

Figure 11: Priorities for digital transformation

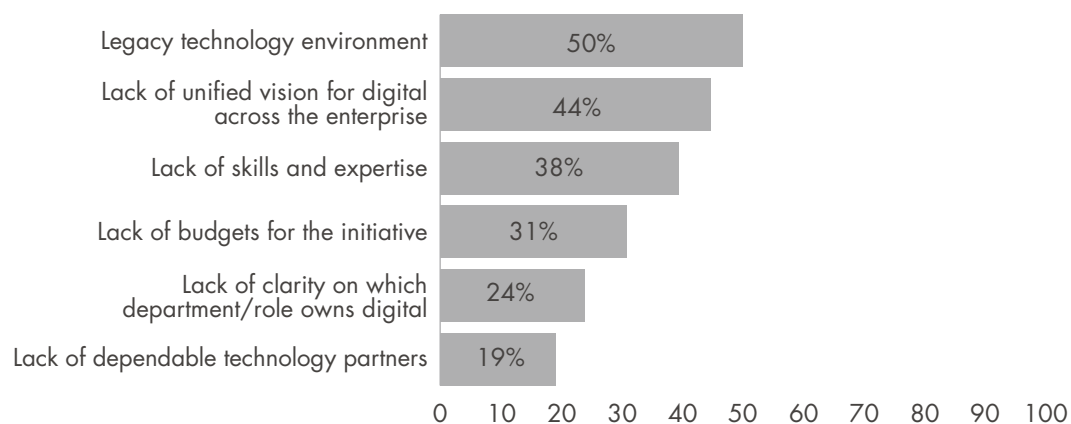
Proportion of banks identifying each priority



Source: Efma-Infosys Finacle Innovation Survey 2016

Figure 12: Barriers to digital transformation

Proportion of banks identifying each barrier

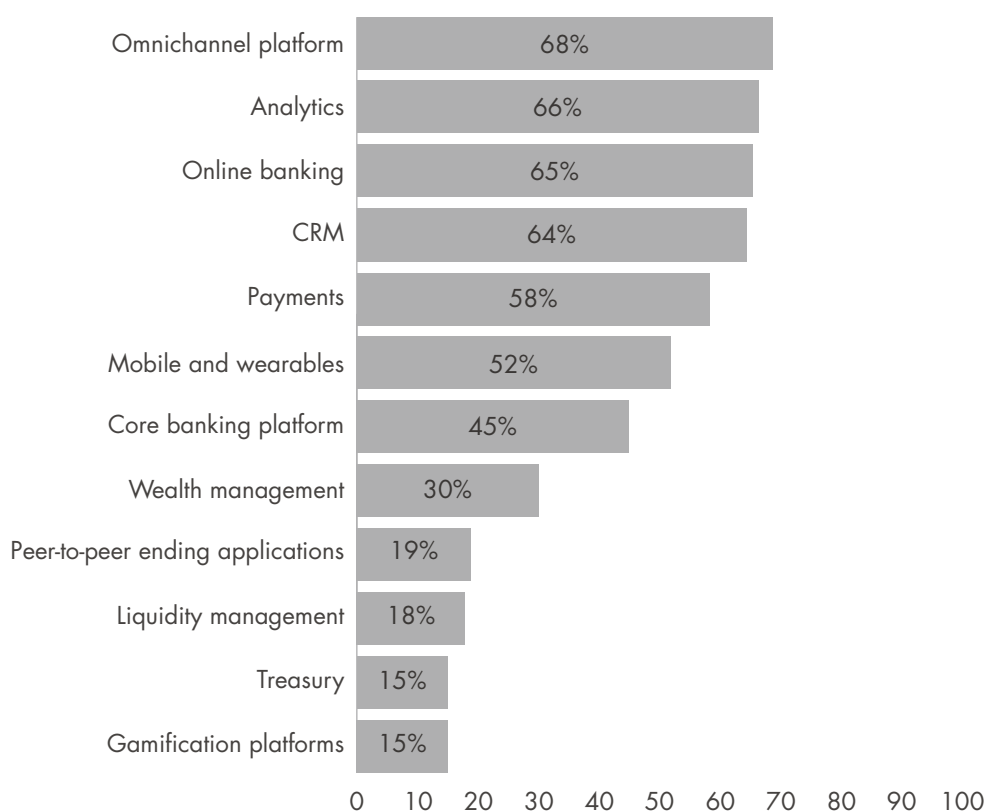


Source: Efma-Infosys Finacle Innovation Survey 2016

We also asked banks how they would prioritize different application areas to modernize their banking application landscape this year, in line with their digital transformation strategy (see Figure 13). This research suggests a focus on omnichannel integration, digital channels (online and mobile) and analytics, including CRM.

Figure 13: Prioritization of banking application areas

Proportion of banks scoring high, where high is a score of 6 or 7 on a scale of 1 to 7



Source: Efma-Infosys Finacle Innovation Survey 2016

This reported investment in banking application areas – focused on channel and analytics applications – aligns with the priorities that banks say they have for digital transformation, i.e. improving customer centricity and omnichannel experience. As we will see in the next section, the biggest focus of investment in disruptive technologies, at least in the short to medium term, is also on advanced analytics/big data, which will further support digital transformation.

3 The impact of disruptive technologies



The impact of disruptive technologies

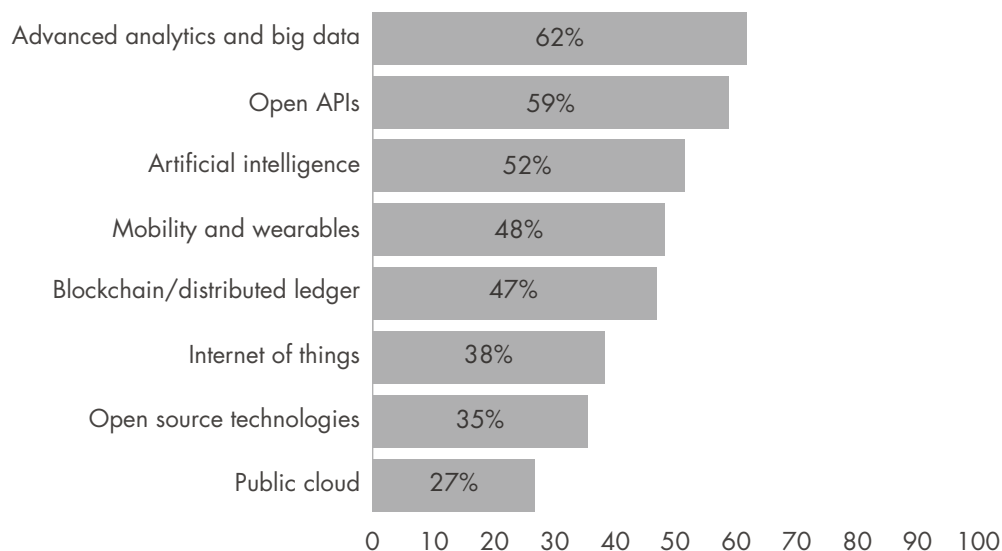
Going beyond digital transformation, there are a series of technologies being applied in banking and elsewhere which will have a profound impact on how the business operates. We have called these disruptive technologies and in this section we assess their likely impact and how banks are approaching their application. In the following section we look at how these new technologies are actually being deployed.

We asked banks what impact disruptive technologies would have on business models and the most significant were believed to be advanced analytics, open API's and artificial intelligence (see Figure 14). For example, 59% of banks think that open APIs will have a high impact (scoring 6 or 7 on a scale of 1 to 7). Mobility and wearables, and blockchain/distributed ledger are also expected to have a significant impact.

Interestingly, most banks do not think that artificial intelligence and blockchain/distributed ledger technologies are having an impact, or likely to have a high impact in the next two years (see Figure 15). In contrast, advanced analytics and big data is already having a high impact and 67% of banks believe that open APIs will have a high impact over the next two years.

Figure 14: Impact of disruptive technologies on banking business models

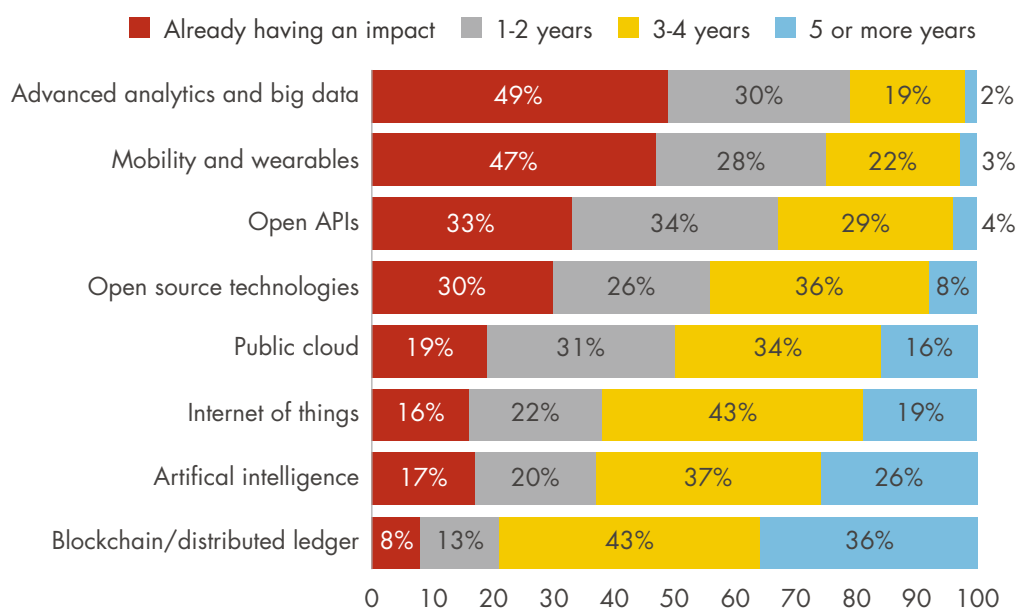
Proportion of banks scoring high, where high is a score of 6 or 7 on a scale of 1 to 7



Source: Efma-Infosys Finacle Innovation Survey 2016

Figure 15: Time period for the impact of disruptive technologies

Proportion of banks reporting each time period for impact to occur



Source: Efma-Infosys Finacle Innovation Survey 2016

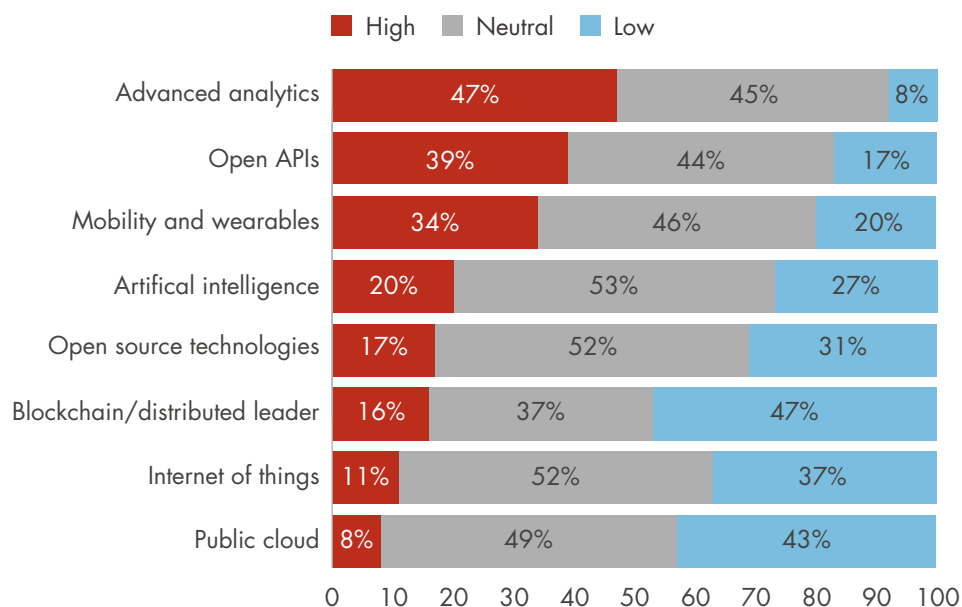
To some extent, these results should correlate with where banks are investing and in broad terms this is the case (see Figure 16). Advanced analytics and big data, open APIs, and mobility and wearables are the areas where most banks have a relatively high level of investment. Artificial intelligence has a relatively high level of investment at only 20% of banks and blockchain/distributed ledger has a relatively high level of investment at only 16% of banks.

In order to access these technologies, 73% of banks say that working with innovative start-ups as suppliers or partners has a high importance (see Figure 17). Also important are internal research and development, and working with firms from other industries. Of course that does not mean that all banks are yet taking these approaches.

Figure 16: Investment in disruptive technologies

Relative significance of investment in disruptive technologies by banks

Using a scale of 1 to 7, the categories are High (6 or 7), Neutral (3, 4 or 5), Low (1 or 2)

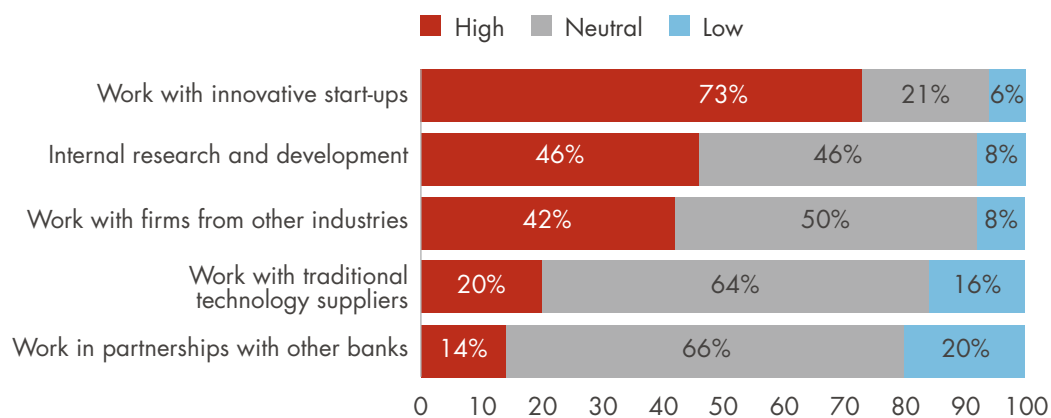


Source: Efma-Infosys Finacle Innovation Survey 2016

Figure 17: How best to access disruptive technologies

Relative importance of different approaches

Using a scale of 1 to 7, the categories are High (6 or 7), Neutral (3, 4 or 5), Low (1 or 2)

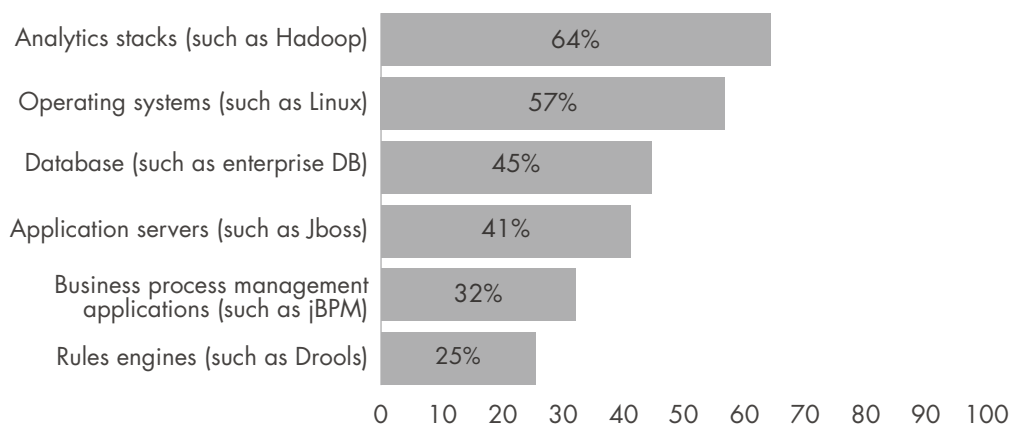


Source: Efma-Infosys Finacle Innovation Survey 2016

Open source technologies are not currently expected to have a significant disruptive impact on banking business models by most banks. Where banks are investing in open source, it is analytics stacks (e.g. Hadoop), operating systems (e.g. Linux), and databases (e.g. Enterprise DB) which are getting the most focus (see Figure 18). Investment in industry standards is mostly on IFRS9 and ISO 20022 (see Figure 19).

Figure 18: Investment in open source technologies

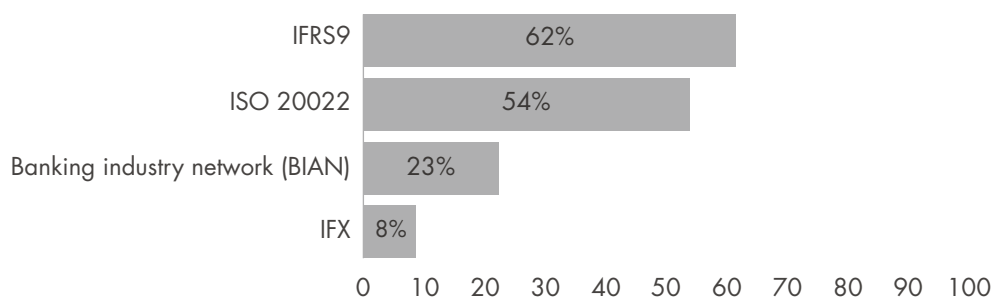
Proportion of banks investing in different open source technologies



Source: Efma-Infosys Finacle Innovation Survey 2016

Figure 19: Investment in industry standards

Proportion of banks investing in different industry standards



Source: Efma-Infosys Finacle Innovation Survey 2016

4 The application of disruptive technologies



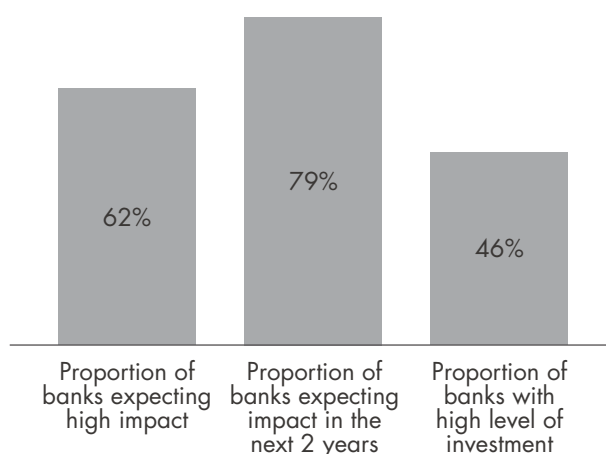
The application of disruptive technologies

Advanced Analytics and Big Data

Of all the disruptive technologies we have surveyed for this study, advanced analytics and big data are expected by banks to have the most impact on the industry. The impact is also expected by the vast majority of banks to be high over the next couple of years so this is not a longer term issue like blockchain/distributed ledger. However, surprisingly, only 46% of banks are investing at a relatively high level in this area (see Figure 20).

Figure 20: Survey results for advanced analytics and big data

High represents a score of 6 or 7 on a scale of 1 to 7



Source: Efma-Infosys Finacle Innovation Survey 2016

Currently, the highest profile application of advanced analytics and big data is in credit scoring. There are a number of start-ups targeting this space. At the core of this is machine learning which is a method used to devise complex models and algorithms that lend themselves to prediction allowing researchers, data scientists, engineers, and analysts to “produce reliable, repeatable decisions and results” and uncover “hidden insights” through learning from historical relationships and trends in the data.

ZestFinance is one example (see page 35), and the link up of Zest with Baidu, the largest search engine in China, is a very interesting development. In another case, Branch International are using machine learning to create credit scores from mobile phone usage in emerging markets. Another good example is Kreditech and we interviewed their founder Alexander Graubner-Müller for the study (see page 55). Kreditech has over 300 employees, the majority of whom are engineers or data scientists, and Graubner-Müller believes that Kreditech is more like a tech company than a traditional retail financial services provider.

CASE EXAMPLES

ZestFinance

ZestFinance was founded in 2009 in the United States by the former CIO of Google, Douglas Merrill. Zest has developed a tech platform that applies Google-like math to credit decisions, consuming vast amounts of data to more accurately identify good borrowers – enabling higher repayment rates for lenders and lower-cost credit for consumers. Zest makes loans under the brand Basix, but also licenses the financial technology platform to other companies.

Zest is using machine learning to disrupt consumer lending and meet the financial needs of people around the world. There is no human interaction of any kind involved in underwriting. Instead, Zest rely on several mathematical models running in parallel to make underwriting decisions. While many creditors take hours, or even days, to make credit decisions, Zest makes them in less than 10 seconds. According to Merrill: “Big data is transforming financial

services as we know it. When we first started ZestFinance, we knew that applying Google-style big data analysis to credit underwriting would make a real difference in reducing the cycle of bad debt, and it has.”

Zest is partnering with JD.com which is China’s largest online direct-sales company. There are more than half a billion people in China with no credit history. This lack of data makes it incredibly difficult to determine credit risk. The Zest platform turns shopping data into credit data, creating credit histories from scratch. In July 2016, Zest received an investment of an undisclosed amount from Baidu, the leading Chinese language search engine in China. Artificial intelligence experts and data scientists at both companies plan to work together to apply Zest’s underwriting technology to Baidu’s search, location, and payment data in order to improve credit scoring decisions in China.

Branch International

Branch International was founded in 2015 in the United States by one of the original founders of Kiva.org, a philanthropic microfinance company. Branch’s free-to-download Android app is a kind of “branchless bank for the next generation,” according to founder and CEO Matt Flannery. The company employs a team of data scientists and engineers in San Francisco and is currently operating in Kenya, with plans to expand to other countries in sub-Saharan Africa.

Branch’s app asks users for permission to access and analyze data stored in their phones. From this data, Branch.co learns and predicts who is likely to be a good borrower, and can give users a credit line from \$2.50 to \$500 in about

10 seconds. Loans are sent direct to a mobile money account and repayments are made from the mobile money account. As the customer builds their credit history with Branch, fees are reduced and larger loan sizes can be accessed.

The machine learning algorithms process thousands of data points to prepare a credit profile and create tailored loan products. The data accessed from the phone includes:

- Handset details
- SMS logs
- Social network data
- GPS data
- Call logs
- Contact lists

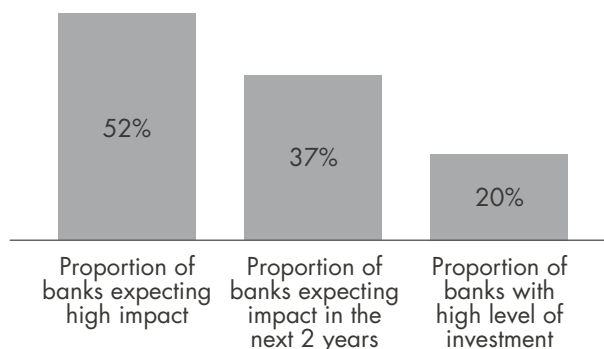
Artificial Intelligence

Artificial intelligence is a branch of computer science dealing with the simulation of intelligent behaviour in computers. It includes a number of sub-fields such as robotics, natural language processing and machine learning and hence there is some overlap with the previous technology area we discussed (advanced analytics and big data) which included machine learning.

Artificial intelligence is expected to have a high impact by 52% of banks, but only 37% of banks think the impact will be significant in the next couple of years. Hence investment levels are currently relatively low (see Figure 21). The key cases we are seeing emerge at the moment are in customer service areas, with virtual assistants combining natural language processing and machine learning to deal with customer queries. Good examples are described below from DBS Bank in India and RBS in the UK.

Figure 21: Survey results for artificial intelligence

High represents a score of 6 or 7 on a scale of 1 to 7



Source: Efma-Infosys Finacle Innovation Survey 2016

CASE EXAMPLES

DBS Bank

DBS is Singapore's largest bank and has operations across Asia. In April 2016, DBS announced the launch in India of a new digital bank called digibank. The bank is the first mobile centric bank to be set up in India. It is completely paperless and allows customers to sign up with the Aadhaar card, a biometrics-enabled ID which has been issued to over one billion Indians in what is the world's largest biometric identification programme.

According to DBS CEO Piyush Gupta: "India's banking system is at the cusp of massive change, and as a bank committed to shaping the future of banking, we are excited to roll out a revolutionary, mobile-only bank. With digital, we are able to create a completely different customer experience. What's more, digibank's efficiencies and lower costs enable us to

pass on significant benefits to customers in the form of greater customer value."

A key feature of digibank is the artificial intelligence driven virtual assistant. Customers can converse with digibank's AI-powered virtual assistant to get their queries answered or banking transactions performed. Because the virtual assistant understands natural language and has learning ability, it is able to respond in real-time. It can already anticipate and answer some 10,000 customer questions, with new knowledge added each day.

DBS is able to leverage futuristic AI technology to deliver hassle-free banking because of its partnership with US-based FinTech, Kasisto, a spin-off from SRI International which created the technology behind Siri.

RBS

In March 2016, RBS announced the roll-out of an artificial intelligence system to support staff who manage relationships with small businesses. The system, known as 'Luvo' was developed with IBM Watson, and is able to understand questions and then filter through huge amounts of information in a split second before responding with the answer. If Luvo is unable to find the answer, it passes the query on to a member of staff who can solve more complex problems. Typical questions Luvo answers with staff, through web chat include:

- My customer has lost their card – what steps do they need to take now?
- My customer has locked their PIN – how do they unlock it?
- How do I order a card-reader for my customer?

Luvo is unique in that a 'human' like personality has been created for it, making it easier for employees to interact with. Its unique psychological profile means it has a warmth to its personality, is approachable, creative and uses a combination of intuition and reasoning when answering questions. Like humans, Luvo has to be trained when dealing with new subject matter, but crucially, it learns from its mistakes and its answers become more accurate over time.

RBS will be exploring if Luvo could be used to answer questions direct from customers – although this will only be considered after small, voluntary, customer pilots. This could reduce the need for people to wait for a human advisor to be free to answer a simple question and at the same time free up time for staff to answer more complex problems.

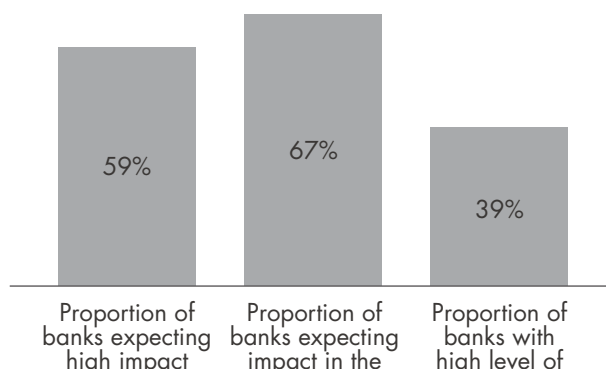
Open APIs

Open application programming interfaces (Open APIs) are one of the next big technology developments in banking. In Europe there will be no choice for banks who must open up their payment systems to third parties under the Payment System Directive 2 (PSD2). Of course this needs to be done in a controlled way and with the agreement of individual customers. However, the potential impact on banking business models is believed to be quite high, and in a relatively short time (see Figure 22).

In the UK, the Competition and Markets Authority's (CMA) retail banking market investigation, has concluded that older and larger banks do not have to compete hard enough for customers' business, and smaller and newer banks find it difficult to grow. This means that many people are paying more than they should and are not benefiting from new services. To tackle these problems, the CMA is implementing a wide-reaching package of reforms. One key measure will be to require banks to implement Open Banking by early 2018. Open Banking will enable customers to share their data securely with other banks and with third parties, enabling them to manage their accounts with multiple providers through a single digital app.

Figure 22: Survey results for open APIs

High represents a score of 6 or 7 on a scale of 1 to 7



Source: Efma-Infosys Finacle Innovation Survey 2016

In Germany, two banks have set out to provide services to other innovative companies encouraging them to build services on top of the bank's open architecture: solarisBank (see below) and Sutor Bank. Established banks like Capital One (see below) and BBVA are taking a lead in developing an approach to working with Open APIs and third party developers.

CASE EXAMPLES

solarisBank

solarisBank was started in Germany in 2015 and was granted a banking license in March 2016. solarisBank describes itself as a tech company with a banking license. Half of its team are working in IT roles. The company was established by FinLeap, an investor in multiple FinTech businesses, such as Savedo (an investment products marketplace).

The company has built an API-accessible banking platform for the needs of the digital economy. The platform enables start-ups, FinTechs and established digital companies to create custom solutions for their unique financial needs. The services offered are:

- Payment services: several compliant payment services including e-money issuing and escrow solutions.

- Banking Services: a full suite of banking services through a state-of-the-art API, including full support for account creation and maintenance, transaction services, as well as deposit and credit business.
- Add-On Services: various value-added services such as AML/KYC-compliant identification, and several identification options via one API.

According to Andreas Bittner, co-founder and Managing Director of solarisBank: "Our services are like Lego bricks. Our partners can pick the bricks they require and assemble custom solutions to fit their business needs. Partners can access services via our easy-to-implement API. The frictionless and straight-forward integration enables partners to launch quickly and concentrate on their core business."

Capital One

Capital One began life in 1988 as a credit card company but is now one of the 10 largest banks in the United States based on deposits. The company was founded with "the belief that the power of information, technology, testing and great people could be combined to bring highly customized financial products directly to consumers". This is still very relevant today.

In March 2016, Capital One became one of the first banks worldwide to open their banking platform to external developers. The company launched, in beta, the Capital One DevExchange which includes self-serve registration and instant API access, sandbox testing environments, documentation, code snippets, and reference applications with sample code. There are currently three APIs which developers can work with:

- SwiftID API is a two-factor authentication product that allows users to give their customers an easy, secure way to approve access requests for confidential information.
- Rewards API allows access to information on the miles, points or cash rewards customers have earned with their Capital One accounts.
- Credit Offers API returns a personalized list of Capital One credit card offers in under 60 seconds based on just a few pieces of personal information.

According to Naveed Anwar of Capital One: "Building a sustainable, vibrant developer community is hard work. It isn't just about APIs, SDKs or toolkits. It's about working together to solve problems...and doing the hard work every day of supporting, servicing, communicating with, adjusting when necessary, and expanding the ecosystem around the community."

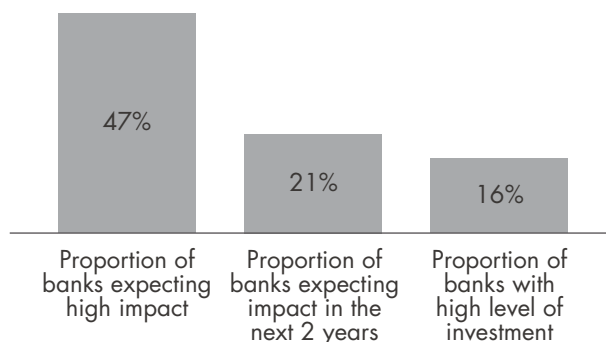
Blockchain/Distributed Ledger

Blockchain or distributed ledger is a difficult technology to explain. According to PwC, at a very high level, the blockchain is a decentralized ledger, or list, of all transactions across a peer-to-peer network. This is the technology underlying Bitcoin and other cryptocurrencies, and it has the potential to disrupt a wide variety of business processes.⁹

There has been a great deal of hype about the impact of blockchain technology on financial services. According to Don Tapscott, author of the book "Blockchain Revolution", in an interview with McKinsey & Co in May 2016, the financial services industry is up for serious disruption or transformation depending on how it approaches blockchain. Investment in blockchain start-ups increased from zero in 2012 to \$496m in 2015 according to CB Insights, and remained at a high level at the beginning of 2016. While 21% of the banks feel blockchain/distributed ledger as disruptive technology will have an impact in the next two years, over 40% feel it will have an impact in 3-4 years.

Figure 23: Survey results for blockchain/distributed ledger

High represents a score of 6 or 7 on a scale of 1 to 7



Source: Efma-Infosys Finacle Innovation Survey 2016

Although the first major application of blockchain has been Bitcoin, a lot of the focus of blockchain research and investment has been in the area of capital markets e.g. for post-trade settlement. Banks and technology companies are developing use cases for blockchain in the areas of remittances and inter-entity payments, trade finance, supply chain finance, digital identity management, smart contracts, document security, collateral management, syndication of loans and treasury functions. The use cases in retail banking may be less significant. One is in cross-border payments as demonstrated by Santander (see page 41) and another is in KYC as demonstrated by Crédit Mutuel Arkéa (see page 41). There are a number of start-ups using Bitcoin for cross-border money transfers, including Circle (based in Ireland) and BitPesa (based in Kenya).

⁹ "What is Blockchain", PwC, January 2016

CASE EXAMPLES

Santander

In May 2016, Santander's business in the UK announced that they would introduce Ripple's blockchain technology to facilitate international payments through a new app. Santander is the first bank in the world to transfer real funds externally and the move is a good example of an established bank partnering with an innovative start-up to exploit a potentially disruptive technology.

Santander are starting with a staff pilot, with the intention to expand the service at a later date. Once the app is downloaded, Santander staff just need to complete their profile and they can start to make payments. It connects to Apple Pay, where users can confirm payments securely using Touch ID. It lets users transfer between £10 and £10,000 and payments can be made from GBP to EUR and USD.

Ripple, the company which provides the underlying technology, was founded in 2012 and has developed an enterprise blockchain solution to improve cross-border payments, drastically reducing the time and cost of settlement and enabling new types of high volume, low value global transactions.

According to Sigga Sigurdardottir, Santander's Head of Customer and Innovation: "We work hard to ensure our banking is simple, personal and fair and believe new blockchain technology will play a transformational role in the way we achieve our goals and better serve our customers, adding value by creating more choice and convenience."

Credit Mutuel Arkea

In July 2016, Crédit Mutuel Arkéa, a large regional French bank, announced the completion of a first blockchain project to improve the bank's ability to verify customer identity. The result of a successful pilot is an operational permissioned blockchain network that provides a complete view of customer identity in compliance with Know Your Customer (KYC) requirements. According to the bank this demonstrates the disruptive capabilities of blockchain technology beyond common transaction-oriented use cases.

As a result of this successful pilot, the bank is working to federate the different silos of customer data to create a single, cross-business KYC platform to inform all of the banks processes, reducing unnecessary duplication of information and requests. The blockchain

identifies and uses all valid existing evidence already stored in the bank's multiple systems of record. This simplifies administrative processes making them reliable for the bank, which in turn can help improve customer satisfaction. Ultimately, Crédit Mutuel Arkéa could enable its customers to deliver proof of their identity to third-parties such as local utilities, retailers or regulated service providers.

According to Frédéric Laurent, COO Innovation & Operations: "Blockchain is a transformative agent in our operational application, as proven by this project - the first of its kind in France. This pilot offers a complete view of customers' documents across our distributed network. The project helped us to understand and master blockchain for other client uses. Now, we are ready to incorporate this technology in our ecosystem."

CASE EXAMPLE

Emirates NBD/ICICI Bank

EdgeVerve Systems, Emirates NBD, the leading banking group in Middle East and ICICI Bank, India's largest private sector bank by consolidated assets, launched a pilot of a blockchain network for international remittances and trade finance. Both, Emirates NBD and ICICI Bank run Finacle solutions suite and have leveraged the blockchain framework to route business transactions between the two entities for remittances and trade finance business.

Using the EdgeVerve Blockchain Framework for Financial Services, the network was successfully piloted on the UAE-India remittance corridor, one of the busiest corridors for both banks. According to the World Bank, this corridor is the largest receiver of remittances with a share of close to 70 Billion USD out of the 580+ Billion USD world-wide.

With this, Emirates NBD became the first bank in UAE, and ICICI Bank the first bank in India, to pilot a blockchain-based network for financial services. The exercise was started eight weeks ago and additional use cases are being explored for the pilot. Both financial institutions have started the process towards a network consortium for further participation by interested member banks to expand the transaction network.

Considering its strong presence in the financial industry through the Finacle suite of

solutions, Emirates NBD and ICICI Bank chose to partner with EdgeVerve for the pilot. This framework is a permissioned asset-agnostic ledger, designed specifically for the banking sector. Blockchain-based applications built on this framework, can deliver enhanced automation across inter-organizational processes, transactional security and accuracy at a significantly lower cost.

With the blockchain network in place, both banks expect automation of inter-bank processes through smart contracts, secure digital exchange of documents and real-time monitoring of positions through integrated dashboards. Consequently, this will lead to significant costs savings for the business. As part of this pilot, remittances, trade finance purchase order and invoice financing processes were executed on the blockchain network. It achieved a near real-time transfer of invoices and purchase orders in a transparent and secure manner. The blockchain network has also been integrated with the Finacle Universal Banking Suite and other host systems within the application ecosystem in both banks. The network model has been designed to be least disruptive to existing systems and processes in banks. This reduces complexity as it allows banks to seamlessly plug in their systems and processes to work with blockchain powered networks.

Mobility and wearables

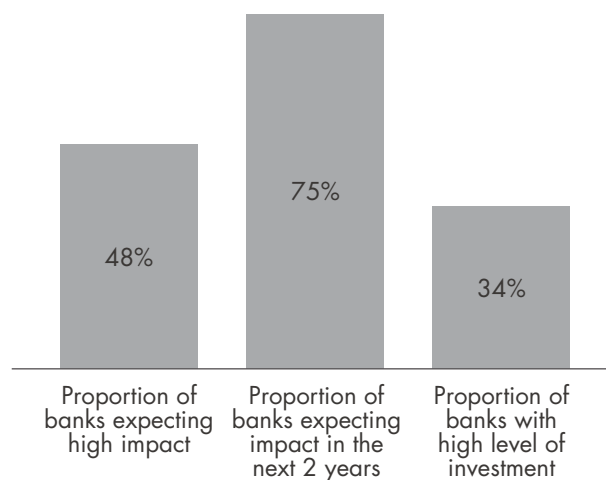
The rapid rise in mobile banking and mobile payments is clear and is a phenomenon which is happening around the world. The latest survey by ING shows that mobile banking use in Europe has risen to 47% of smartphone users, and in the US the figure is 53% (in the 12 months to April 2016).¹⁰ Mobile payments use in Europe has reportedly risen to 40% of smartphone users and in the US the figure is 42%.

Interestingly, only 48% of banks in our survey expect mobility and wearable technologies to have a high impact on banking business models, although the vast majority expect the impact to be within the next 2 years (see Figure 24).

The large number of banks being launched which are mobile-focused will test what impact there is on the banking industry. These launches are coming thick and fast from start-ups, from telcos (some in partnership with banks), and from established banks.

Figure 24: Survey results for mobility and wearables

High represents a score of 6 or 7 on a scale of 1 to 7



Source: Efma-Infosys Finacle Innovation Survey 2016

Developments in wearables are slower to emerge. Although several banks created applications for the Apple Watch, this product is not taking off at the rate some expected and hence the impact is somewhat limited so far. However, other wearable payments services continue to be developed and promoted such as Barclaycard's bpay, and companies like Fitpay offer wearable device manufacturers the capability of adding secure payments functionality to their products.

¹⁰ ING International Survey, Mobile Banking July 2016

Other potentially disruptive technologies

The Internet of Things (IoT) is the network of physical devices, vehicles, buildings and other items embedded with electronics, software, sensors, actuators, and network connectivity that enable these objects to collect and exchange data.

There is no doubt that the IoT is an important technology development with more and more items being fitted with sensors and connected to the Internet. However, only 37% of banks expect the IoT to have a high impact on retail bank business models. As for artificial intelligence, the majority of banks expect that impact to be more than 2 years away and investment levels are relatively low. Whereas there are some clear use cases in insurance, the use cases in banking are not as clear or compelling.

Of all the technologies we surveyed, public cloud and open source were the least expected to have a disruptive impact on banking business models. Only 24% of banks thought the impact of public cloud technologies would be high and only 34% of banks thought that the impact of open source technologies would be high. Investment in these technologies is relatively low compared to the other technologies we surveyed.

Nevertheless, some innovative banks are taking important steps in these areas which are enablers of innovation. BBVA recently announced a partnership with Red Hat for open-source based cloud technology. According to BBVA: "The partnership is designed to focus on business and technical alignment to support BBVA to accelerate innovation, manage the growth of financial transactions on digital devices and deliver digital banking services to its global customers".

5 A regional view of the research findings



A regional view of the research findings

When we look at innovations across the world, it is more useful to compare countries which are at different stages of development rather than in different regions. At Efma, we typically consider three different country income groups:

- High income: GDP per capita > Int\$30,000 e.g. United States, Australia
- Middle income: GDP per capita Int\$15,000-30,000 e.g. Hungary, Malaysia
- Low income: GDP per capita < Int\$15,000 e.g. China, Nigeria

The low income countries are often referred to as emerging or developing markets. The table opposite sets out some of the key survey results by country income group. This year we found that:

- **Innovation trends**

Banks in low income countries are much less likely to have an innovation strategy than banks in other countries, and have a lower self-rating of innovation performance, but more of them appear to be increasing innovation investment in 2016. Banks in middle income countries rated themselves highest on innovation performance.

- **Threat of industry disruption**

Banks in high income countries are most concerned about disruption from challenger banks, and less concerned about the threat from telcos. However, banks in middle and low income countries are more concerned about the threat from telcos. Banks in low income countries are not particularly concerned about the threat from start-ups.

- **Impact of disruptive technologies**

There is a striking difference here with banks from low income countries not expecting a high impact from blockchain/distributed ledger technologies, and generally expecting the impact of other disruptive technologies to be lower than banks from high or middle income countries. The banks from high and middle income countries are relatively similar in their expectations.

There are some very common developments taking place across countries and regions, including:

- **Digital banking**

New mobile focused, digital banks are opening in all regions of the world and in all country income groups including for example DBS Bank in India and UniCredit in Italy, as well as numerous venture capital funded start-ups like Atom Bank in the UK and Neon in Brazil.

- **Mobile money and mobile payments**

Mobile money services are most commonly being opened in emerging markets, and often by telcos (sometimes in partnership with banks). However, simple mobile payment services are available in most developed countries offered by companies like Apple or Samsung, by consortia of banks (e.g. Swish in Sweden) or by individual banks (e.g. Danske Bank's MobilePay in Denmark).

- **Marketplace lending**

P2P lenders are now generally referred to as marketplace lenders. The first such lenders were in the United States but can be found in many other countries like Canada, Australia, South Africa, India, and China. This type of business is not confined to developed markets as the examples of India and China clearly show.

- **Advanced credit scoring**

Related to the development of marketplace lenders is the development of advanced credit scoring using big data and machine learning. While the technology and core expertise for this tends to be in advanced countries like the United States and Germany, the applications can be found in many countries around the world, including emerging markets.

Comparison of selected survey results by country income group

	High income countries	Middle income countries	Low income countries
Innovation trends			
Percentage of banks with an innovation strategy	77%	83%	52%
Percentage of banks increasing investment in 2016	76%	77%	88%
Percentage of banks more innovative in last 12 months	71%	60%	68%
Self-rating of innovation performance (scale of 1 to 7)	4.72	5.04	4.54
Threat of industry disruption			
<i>Scale of 1 to 7, where 1 is very low and 7 is very high</i>			
Technology companies	5.18	5.75	4.74
Start-ups - challenger banks	5.20	5.21	5.00
Start-ups - other	4.74	4.78	4.23
Telcos	4.40	4.96	4.74
Expected impact of disruptive technologies			
<i>Percentage of banks scoring 6 or 7 on scale of 1 to 7</i>			
Advanced analytics and big data	66%	53%	56%
Open APIs	63%	56%	43%
Artificial intelligence	55%	53%	33%
Blockchain/distributed ledger	55%	44%	8%

Source: Efma-Infosys Finacle Innovation Survey 2016



Innovation case studies

The following section describes five different innovation cases based on our interviews (in alphabetical order):

Alior Bank

An innovative bank from Poland which was set up in 2008 has now opened an innovation lab to focus its research and innovation investment in new areas like artificial intelligence.

Bradesco

One of the leading banks in Brazil, has a wide ranging innovation program working with start-ups and with industry leaders on emerging technologies.

Deutsche Bank

A significant retail and SME banking player in several markets, has invested to introduce new digital propositions and work on disruptive technologies.

Kreditech

An innovative start-up from Germany, is using advanced analytics and big data (including machine learning) to build a consumer finance business in emerging markets.

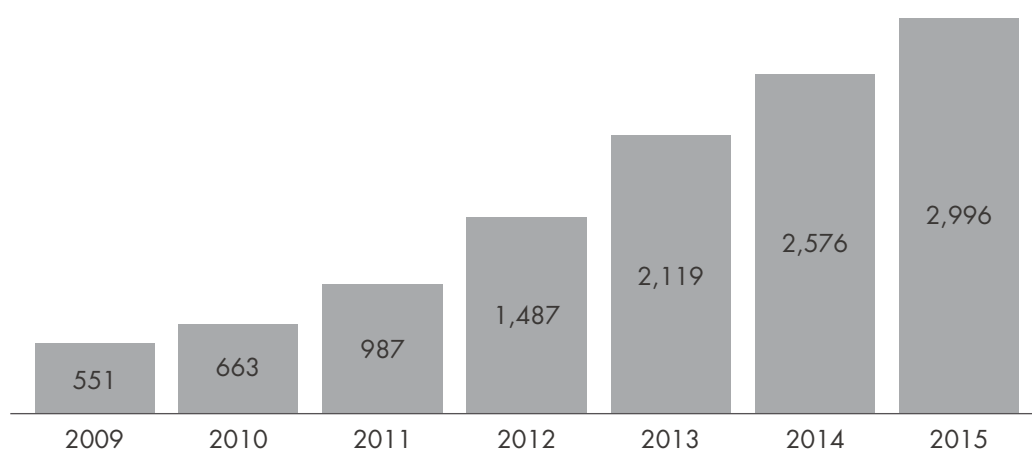
UniCredit

One of the largest and most international of retail banks, has invested in setting up a digital bank in Italy which adopts a different business model from the parent bank.

Alior Bank

Alior Bank was launched in Poland in 2008, starting life with 40 branches and 1,000 employees. It is now one of the fastest growing banks in Poland. The company had a successful IPO in 2012 and by the end of 2015 had around 3m customers and over 6,000 employees. Alior Bank's stock is in the WIG20 index of the biggest and most liquid stocks listed on the Warsaw Stock Exchange. The 2015 net profit of the Group was PLN 310 million and at the end of 2015, total assets were PLN 40 billion, an increase of 33% from 2014.

Alior Bank customer numbers ('000)

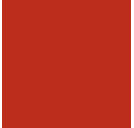


Source: Alior Bank Annual Reports

Alior has always had an innovative distribution strategy, building up various different types of branches and agencies, as well as online and mobile channels. Alior launched an innovative banking partnership with T-Mobile in May 2014 and within 18 months had 245,000 customers. The cooperation with T-Mobile has also brought a significant increase in the volume of loans and in the first half of 2016 Alior acquired PLN 270.3 million of loans. The Bank is also recording a dynamic growth of sales of loans for financing mobile devices in T-Mobile stores. Thanks to the full integration of the Bank's and T-Mobile's sales process at the end of June 2016 over 93,000 of such transaction were made. Almost 90% of the contracts were concluded with customers who hasn't used T-Mobile Banking Services delivered by Alior Bank before. The partnership is being extended into Romania with the planned launch of a digital bank in 2016.

In 2015, the bank decided to create the Innovation Lab to focus on industry changing opportunities. The lab has four teams:

- R&D
- New technologies and prototypes
- Design thinking
- Co-operation with partners - large companies and start-ups



In order to ensure a smooth journey from idea to execution, the Lab's work is based on a different set of rules than other departments. The Lab's team works from one of the biggest Polish start-up accelerators and reports directly to Alior's CEO. There is also a separate budget which is not subject to periodic planning. The whole concept is not isolated and restricted only to one unit, it is engaging the whole bank. The Innovation Lab's aim is to be an organizational home to nourish and facilitate new ideas. It is acting as a methodology expert and facilitator for the most critical innovation teams across the company, supporting them in new product and service initiatives.

We discussed Alior Bank's approach to working on some disruptive technologies with Monika Pańczyńska and Igor Zacharjusz from the Innovation Lab:

- **Distributed Ledger/Blockchain:** Alior sees this as a very important technology which can change the way the bank does business. They are working with partners, including MasterCard and others at The Heart Warsaw, to assess potential use cases and expect some developments will be ready in the next 12 months.
- **Open APIs:** Alior also expect this technology to have a big disruption effect on the industry. Banks need to be ready to open up and work with partners in a totally new way, particularly in Europe with the implementation of PSD2 in 2018. Alior are working on Open API projects with partners at The Heart Warsaw.
- **Artificial Intelligence:** Alior has already launched an industry leading initiative based on this technology, conducting debt collection or marketing surveys. The service is called "Dronn" and is based on a partnership with a start-up, VoicePIN (see below). Alior expect services based on AI to both reduce costs and improve customer experience.

Dronn Agent

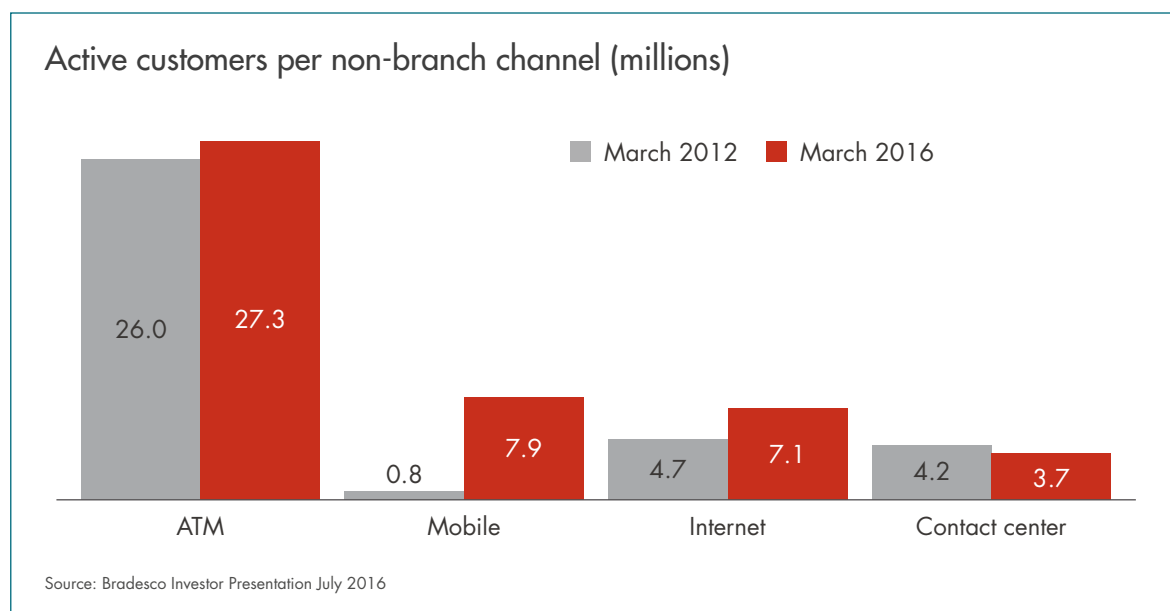
The Virtual Advisor Dronn is an intelligent virtual agent, designed to respond quickly and consistently to customers and interactively guide them through a personalized conversation. Usage of artificial intelligence (AI), natural language processing (NLP), automatic voice recognition (ASR), semantic analysis and speech synthesis (Text to Speech – TTS) allows Dronn to interact with customers in a natural conversational style, understand customer's answers, navigate the conversation and respond appropriately.

Dronn has not only transformed the Contact Center into the most advanced service center, but also generated cost savings. The project was inspired by demand for sophisticated self-service support options in electronic channels. Last year, the system was implemented for debt collection campaigns and marketing surveys and completely revolutionized both processes. On the one hand it delivered the best possible customer experience and, on the other hand, significantly reduced the bank's costs.

Bradesco

Bradesco is one of the four large retail banks in Brazil with nearly 70m customers. Brazil has a population of over 200m and is what we would describe as a middle income country, with a strongly growing middle class. Parts of the financial services market operate much like in a well-developed economy but there is also a large unbanked or underbanked population which is harder to reach with financial services.

The trends in digital channel development for a bank like Bradesco are very interesting to observe. The number of active mobile channel users exceeded the number of active internet channel users in the first quarter of 2016. Mobile transactions represented 37% of all bank transactions in the first quarter of 2016, about the same as internet transactions.¹¹



The bank has the objective of being an innovation leader and has adopted an approach of open innovation. We spoke with Marcelo Frontini, Head of Innovation at Bradesco, about how the bank is working with disruptive new technologies and start-ups:

- Regarding **artificial intelligence**, the bank is partnering with the IBM Watson project to develop applications, and the first deployment of an AI application will be during 2016. Bradesco's involvement with IBM has resulted in Portuguese becoming the third language developed for Watson. Frontini believes strongly in the potential for AI to improve customer experience and engagement and that we will see many examples of real life deployments in the next couple of years.
- To make progress with **distributed ledger or blockchain technology**, Bradesco has joined the R3 consortium. The first stage here is to study the potential use cases which could be for international money transfers or for money transfers with the unbanked in Brazil. Frontini believes that some KYC or smart contract use cases will develop quite quickly but that it will take a while for private blockchains to develop in other areas.

¹¹ Source: Bradesco Investor Relations Presentation, July 2016

- Many banks are building APIs but few are actually “**open APIs**”. Typically, they only allow access with pre-determined partners. Banks are developing in this area but are not yet able to operate like Facebook. Bradesco has been ahead of the curve in modernizing its IT systems for the digital age. The core banking system has been changing to a service-oriented architecture (Bradesco as a service) for the last 7 years and this has been very helpful for implementing APIs. The bank is developing a new digital platform which will operate using APIs, and will enable paperless processes.

There are a handful of new digital banks in Brazil which have set out to challenge the established banks, but their impact so far has been limited. Frontini expects the incumbent banks, like Bradesco, to fight back strongly. The bank has been good at customer retention and has been very successful with a free mobile broadband offer which, combined with good mobile banking apps, makes it less attractive for customers to leave for a new bank. Bradesco will also consider using its new digital platform to launch a new mobile app for the millennials.

As part of the open innovation approach, Bradesco has for some time been working with start-ups and other partners. The bank has a start-up programme (inovaBRA.com.br) which currently involves 12 start-ups. Frontini feels that the development of FinTechs is more of an opportunity for banks than a threat. Only a few will be successful on their own and the banks can learn from many of the FinTechs and use their solutions. However, it is important for banks to change their mindsets and be prepared to connect and work with smaller companies.

Deutsche Bank

Deutsche Bank is the largest privately owned bank in Germany and also has significant retail and business banking operations in Italy and Spain. We spoke to Roberto Mancone who is Global Head of Disruptive Technologies about digitalization and the use of new technologies.

In the process of digitalization, Mancone says that banks need to look beyond incremental innovation in order to avoid the risk that new technological innovation and user experience will no longer be a differentiating factor in the long run.

In order to offer innovative value added services to clients and non-clients, irrespective of the main bank for traditional products, Deutsche Bank launched its innovative SME portal in Italy in 2015, called db Impresa eXtra and in March 2016 in Germany called db Unternehmer Portal. The same portal will be launched in Poland in July 2016.

The portal is a digital engagement platform, where the more data SMEs provide about their industry and future growth, the more insight they gain from the platform. The bank can then leverage this customer data and insight to establish a meaningful and relevant dialogue about how to help them succeed and grow. The platform includes 4 applications:

- Plan HQ – intelligent business planning
- Export enterprise – empowering international trade by helping businesses engage more effectively in the global market place and enabling them to stay compliant when trading
- Credit HQ – business credit reports
- Size up – helps SMEs gather business insights by comparing their data with others in their industry enabling them to see how they benchmark and make better decisions

The strategy behind this development for Deutsche Bank is:

- To better engage clients, reduce attrition, and increase the use of digital channels
- To create new revenue streams from non-clients who can also use the service
- Generate data and insights from usage of the portal

At the same time, Mancone said that disruptive technologies are not disruptive if they are welcomed within the organisation in order to enhance and envision new business models, while they are disruptive if handled only by the competitors. We asked him about the 3 main disruptive technologies:

- Mancone stated how artificial intelligence is exponentially increasing its implementation in the medical industry, financial industry and insurance sectors. AI can be a powerful tool for empowering relationship managers and developing digital scalable advisory models. Useful solutions will come from natural language processing, extraction of data and answering questions, and generation of next best actions. The technology is moving fast and many proofs of concept are now being deployed in banking.
- According to Mancone, the development of distributed ledgers, smart contracts and blockchains will be in terms of closed permission blockchains for banks and regulators. Almost 43 banks are part of the R3 consortia aimed at developing a uniform protocol in the near future. There are valuable use cases with regards to smart contracts which can help generate operational efficiency within a bank even if the distributed ledger will be developed in a second stage.
- In terms of APIs the development of limited private access to APIs is already in existence, enabling some FinTechs to build their businesses on the back of the systems of established banks (Solaris Bank is an innovative example in Germany). In Europe, Mancone highlights how PSD2 will have a big impact offering opportunities and threats for incumbents forced to provide other companies access to their data.

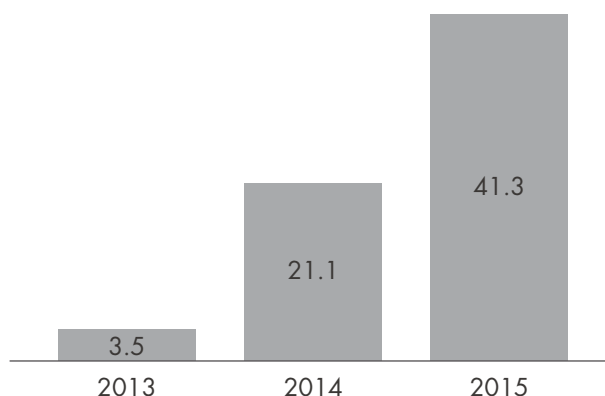
Kreditech

Kreditech is an innovative, venture capital funded company which was founded in Germany in 2012 to provide credit to the underbanked. The company is an excellent example of a new business model built around advanced technology. We spoke to the founder Alexander Graubner-Müller who explained the approach taken by Kreditech.

Combining non-traditional data sources and machine learning, the company is aiming to provide access to better credit and a higher convenience for digital banking services. The product offerings include consumer loans, a digital wallet and a personal finance manager designed to help customers manage their credit score and plan their spending. Kreditech also offers a “credit as a service” model, allowing partners to integrate its credit products as a payment method or funding source. The company operates in 5 core markets: Poland, Spain Czech Republic, Russia, Mexico and, as of June 2016, had processed almost three million loan applications.

The company has been successful, reaching over €40m (US\$43m) of revenue in its third full year since launch. They have raised around €138m (US\$150m) in equity funding from leading private equity investors, and most recently also from the IFC (part of the World Bank) to support Kreditech’s mission to bank the underbanked.

Kreditech revenues (€m)



Source: Kreditech

Machine learning was initially the key technology driver in the company’s innovation. New data available from, for example, social media and web browsing means that data is more context sensitive and machine learning can use this data to understand more granular relationships. In fact, there are around 20,000 data points used for each loan application, with decisions being made independently from credit bureau. According to Graubner-Müller, with the liberalisation of data, we live in a world where customers can easily share personal data with other services (e.g. Facebook Connect, Banking APIs) and it is becoming far less relevant which company owns the data but which company can transform data into the highest value for the customer. However, it is also important that the whole business has been built as digital from the start. The company use a paperless, and fast application process with immediate scoring and pay-out – with scoring taking just 32 seconds.

In 2015, in order to build on the core consumer loans business, Kreditech acquired Polish company Kontomatik which has built a market leading account aggregation technology to verify client identity (KYC) and gain read-only access to bank accounts. KontoX provides a missing API to bank systems using a sophisticated financial technology that works worldwide with any bank. The strategy is to build a personal finance ecosystem in multiple countries based on big data, machine learning and open APIs.

In 2016, Kreditech launched an online point-of-sale financing product to extend its consumer lending product portfolio. With its newly developed “credit as a service” API, Kreditech is planning further integration with clients from the online, payment and banking space.

Creating an innovation culture at Kreditech has been helped by the fact that it is a start-up, now comprising over 300 employees. They have focused on hiring the right people, the majority of whom are engineers or data scientists, and Graubner-Müller believes that Kreditech is more like a tech company than a traditional retail financial services provider. Empowerment and being prepared to try new things in a “test and learn” approach are also crucial factors driving innovation at the company.

UniCredit's buddybank

UniCredit is a leading global bank with operations in 17 countries, nearly 8,000 branches, and more than 140,000 employees. As part of its digitization strategy and investment, the bank has announced it will launch an innovative new mobile bank in Italy in January 2017, called buddybank. Efma was able to understand more about this important strategic development thanks to an interview with Angelo D'Alessandro, buddybank founder.

UniCredit's digital strategy


Digital strategy to accelerate retail multichannel transformation

Supported by EU 1.2 bn investments (2016-2018)

ACCELERATE THE DIGITAL TRANSFORMATION

Delivery model update	Continue transaction migration to remote channels Right-sizing footprint with new and flexible formats
Simplification and process digitalization	Digitalize and simplify back-end processes Fully-digitalized document management Credit Revolution program aiding real time automatic credit decisions
Increase sales	Extend end-to-end

BUILD A FUTURE DIGITAL BUSINESS MODEL

A new digital core banking system	New cheaper IT infrastructure to serve customers' basis purchase behaviors, reducing cost-to-serve
	1st molecular bank offering a pure mobile customer experience with a 24/7 live-caring concierge Plug-and-play platform to facilitate new markets entrance Implementation started, launch early 2017

Source: UniCredit Annual Reports 2015

According to D'Alessandro: "buddybank will offer a pure mobile customer experience with a 24/7 live caring concierge, founded on a super-secure, light and adaptable new "Open API" IT architecture, 100% separated from UniCredit. It is designed to create an ecosystem of the most successful start-ups and services. There is fast scalability and pay-off in order to enter in any new geography in less than 1 year. Developed as a start-up with unprecedented customer per FTE ratio and cost-to-serve, buddybank is defining new standards for the whole financial industry."

The bank will have three traditional financial products - current accounts, credit/debit cards and instant and contextual loans - as well as a 24/7 concierge service, accessible via chat and phone, that can help with everyday tasks such as restaurant reservations, taxi booking and travel planning.

Through its innovative technology, buddybank will be able to identify its customers in just a few seconds, without the pushing of buttons or security questions. Meanwhile, customers will be able to open a buddybank account in just a few minutes by mobile only, use it to access instant loans, control their cards from the smartphone, or focus on personal goals.

The bank is a cornerstone of UniCredit's digitalization and innovation strategy and thanks to the 'molecular' nature of the bank, which makes it adaptable to the needs of different markets, buddybank already started a feasibility study in other geographies. With an investment of €50 million, the start-up is targeting one million customers in Italy in five years and is forecast to break even in year three with 300,000 customers.

D'Alessandro believes that traditional banks are making tremendous steps toward digitalization, including UniCredit which is investing more in innovation. However, banks will have to continue to change in order to be quicker, more sustainable and to be available when clients need them. The institutions that make brave decisions and choices will be able to make profits in a market that is becoming more competitive. Survivors will be the banks that will adapt and that will "run faster" than the others. However, buddybank is born digital so it will not need to transform like a traditional bank. Created from scratch with complete autonomy, buddybank will act as "positive fighter brand" for UniCredit and, thanks to its agile nature, will act as a test for new technologies and even more innovative partnerships. An advantage over some other challenger bank start-ups is that it will have a full banking license, instead of just being a nice front-end using the back-end of a traditional bank.

The bank will run on a newly designed modern information system architecture. The API layer was identified from the beginning as a core component and an "open bank" paradigm guided the partner ecosystem implementation. This approach allows buddybank to securely and rapidly enhance the digital offerings and broaden its commercial reach. The bank is fostering innovative partnerships to offer value added services and a best of breed "user experience", exploiting bank and partner data jointly to anticipate customer needs.

Conclusions

The results of our study are encouraging. Banks continue to invest in innovation and are responding to the threat of industry disruption. The recent boom in FinTech may be levelling off in 2016, and the challenges encountered by some early FinTech pioneers like Lending Club might suggest that the threat from these start-ups is not as high as some expect. However, it is still early days in the revolution taking place and the technologies are still being developed which can have a big impact on the business models of banks.

Digitalization of banking is now moving at full speed with substantial investments being made. This is not just about moving transactions from physical to digital channels. Digitalization of end-to-end processes is also crucial for achieving efficiency gains, and to some extent for delivering a better customer experience. There are difficulties making digitalization happen quickly in a larger, established bank, hence the interest in setting up stand-alone digital banks which start with a completely different mode of operation. These digital banks also provide the opportunity to experiment with a range of new innovations.

We can already see that advanced analytics and big data are making a difference, but the big change in the next couple of years is likely to come from the development of open APIs. Some banks are being pro-active in this area but all banks will be forced to some extent to open up their closed systems, providing opportunities for new players. However, there will also be opportunities for the banks themselves to innovate further with open APIs.

Technologies like artificial intelligence and blockchain/distributed ledger will take longer to have an impact on banks, particularly in retail banking. A few applications are starting to emerge. The long term impact is still too hard to predict but banks are in a good position to participate in any important developments.

One challenge for banks, in a financial environment which continues to be difficult, is how much to invest in innovation, and where. There are many options and we can see examples of lots of different strategies, including acquisitions, investments and partnerships. Having an innovation lab of some description now seems to be a basic requirement but there are still questions about how these should be focused.

Small and medium sized banks might be at a disadvantage to larger banks when it comes to innovation investment. However, there are steps they can take to ensure they are keeping up:

- Monitor developments: Make sure your bank is aware of all the critical innovations taking place around the world and understand how these are impacting the business model of banking.
- Focus on culture: Smaller banks will have an advantage over larger banks when it comes to developing an innovation culture so this is an area on which to focus attention.
- Be very selective: With limited resources, be very selective and disciplined in choosing areas in which to invest.
- Leverage relationships: Make use of relationships to access innovation at lower cost, for example by partnering with suppliers, start-ups or even other banks.

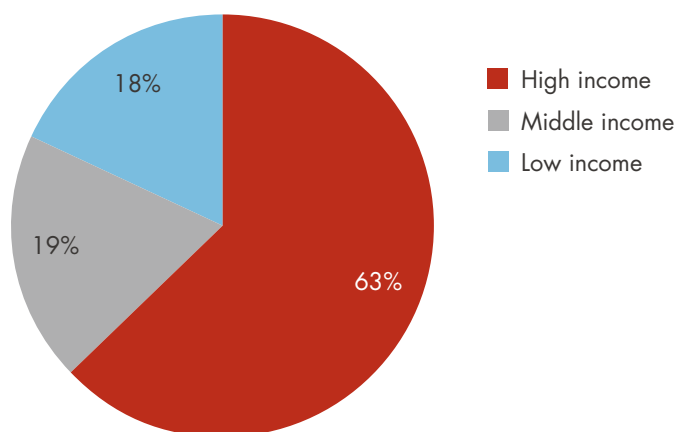


About the research

There were 158 respondents to our online survey in 2016, representing more than 56 countries around the world. Overall, 63% of respondents were from high income countries, 19% were from middle income countries and 18% were from low income countries. We define country income levels as follows:

- High income: GDP per capita > Int\$30,000 e.g. United States, Australia
- Middle income: GDP per capita Int\$15,000-30,000 e.g. Hungary, Malaysia
- Low income: GDP per capita < Int\$15,000 e.g. China, Nigeria

Figure 25: Survey respondents by country income level



Source: Efma-Infosys Finacle Innovation Survey 2016

Online survey questions

- 1 Does your bank have a clearly defined innovation strategy?
- 2 Do you expect your bank to increase or decrease the level of investment in innovation in 2016 compared to 2015?
- 3 In which areas do you believe your bank has become more or less innovative in the last 12 months?
- 4 How do you rate your bank's innovation level in each of these areas and overall?
- 5 How significant is the threat of disruptive innovation from different actual or potential competitors?
- 6 In which product/service areas do you expect the emerging competition to have significant impact?
- 7 In which of the following ways does your company work with innovative start-ups in financial services?
- 8 What is your bank's strategy for transforming for the digital age?
- 9 If you plan to launch a digital only banking business, what will be different from the traditional business?
- 10 What are the top priorities for your institution's digital transformation?
- 11 How significant are the following barriers to effective digital transformation for your bank?
- 12 What percentage of your total transactions are routed through the following channels?
- 13 How significant in terms of investment at your bank are the following technologies for driving digital transformation?
- 14 In your opinion, how disruptive will the following technologies be for traditional banking business models?
- 15 Over what time period do you expect to see a significant impact on traditional banking business models from these and other new technologies?
- 16 In order to innovate with these and other new technologies, what is the relative importance of the following approaches?
- 17 If your institution is investing in Open Source technologies, please list the areas prioritised.
- 18 What are the industry standards your institution is investing in?
- 19 How would you prioritize these application areas to modernize your banking application landscape this year, in line with your digital transformation strategy?



Notes

Notes



Notes

About us



As a global not-for-profit organisation, Efma brings together more than 3,300 retail financial services companies from over 130 countries. With a membership base consisting of almost a third of all large retail banks worldwide, Efma has proven to be a valuable resource for the global industry, offering members exclusive access to a multitude of resources, databases, studies, articles, news feeds and publications. Efma also provides numerous networking opportunities through working groups, webinars and international meetings. True to its vocation, Efma has recently developed an Innovation portal which aims to identify and award the most innovative projects in the retail financial services arena.

For more information: www.efma.com



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About the author

Michael Pearson is a strategy and corporate development expert with 30 years' experience working for and advising financial institutions worldwide, developing new ventures, and investing in start-ups. Michael founded Clarus Investments in 2006 to advise financial institutions on strategy and to invest in early stage ventures. Michael is also the author of the Efma Yearbook, which is an analysis of trends in the global retail banking industry. Michael has an MBA from Harvard Business School.

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Innovation in Retail Banking

October 2016

