



Current Issues

Digital economy and structural change

Fintech reloaded – Traditional banks as digital ecosystems

With proven walled garden strategies into the future

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Digital structural change is piling up the pressure on traditional banks. Despite other societal and regulatory challenges banks have recognised the importance of digital developments and are working intensively on potential solutions and strategies. Many (digital) innovations can primarily be experienced at the client front-end. There is, however, much more to this topic.

Isolated solutions are often only implemented in a fragmented fashion from division to division. Innovation processes are still being driven forward laboriously using an outdated silo approach. Furthermore, many banks' command of the global "language of the internet" is still deficient. The banks will not achieve resounding success using such methods. Digital change requires far-reaching structural reforms that extend beyond all internal and external bank processes and systems.

The new market players from the non-bank sector, by contrast, have an almost perfect understanding of the language of the internet. First and foremost it is the scarcely regulated digital ecosystems, but there are also many fintechs that are using their platforms and ingenious "walled garden" strategies to dominate markets across a range of sectors. Their recipe for success is based on the harmonious interplay between implemented hardware and software. Via the optimum interlinking and utilisation of compatible and interoperable standards/technologies we – the platform-spoiled consumers – are courted with attractive products and services conveniently, globally and from a single source.

Traditional banks could do this, too, however. This now provides the opportunity to swiftly learn and adopt the strengths and particularly the monetisation strategies (walled gardens) of the successful digital ecosystems.

There are many benefits to be gained by banks that transform themselves into platform-based, digital banking ecosystems. Apart from easy access to numerous personalised products and services, including those of external providers, as well as a more secure IT environment, the customer can also make interactive contributions on the financial platform in a variety of useful networks. Furthermore, the banking ecosystem offers a flexible corporate architecture that will in future enable as-yet-unimagined technologies to be docked onto one's own infrastructure in a timely fashion and at an acceptable cost.

This requires above all open programming interfaces and the use of advanced key technologies: besides using compatible and interoperable technologies both structured and unstructured data must be recognised (machine-readable), evaluated and processed. The combination of automation and self-learning algorithms instrumentalises the user's own data consumption in order to generate new products, services and processes. Cognitive, self-learning systems provide valuable services to the future banking ecosystem.



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Breathtaking technological progress

1. The digital age is forcing us all to think again

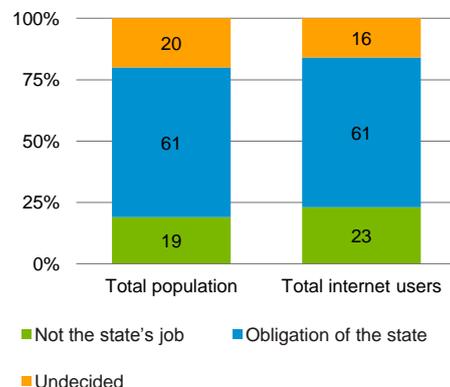
The technical advances made in internet technologies during the past decade are breathtaking. Mobile internet, self-learning algorithms, predictive analytics, humanoid robotics, holograms, 3D printing at home, web-based contact lenses for diabetics¹; drones and hot air balloons that transmit open Wi-Fi² to Earth and autonomous vehicles are evidently just the beginning of digital and societal change. The development is being driven by ever smaller and cheaper sensors, biometric recognition software and the lower-cost computing power of digital tools. Targeted investment in start-ups and projects and the insatiable urge to monetarise digital, disruptive solutions also play a pivotal role in this. The resulting interdisciplinarity, that is the combination of knowledge from the fields of algorithms, statistics, cryptography, artificial intelligence, robotics, behavioural sciences, mathematics and IT, has become indispensable in the meantime.

Growing legal uncertainty

The dynamism and accelerating pace of innovation in internet technologies, above all in the area of the “internet of things”, are both fascinating and disturbing. The latter is perhaps also because at the moment it seems as if everything that is technologically possible is also on offer in the markets, regardless of the legal framework. We therefore find ourselves in the midst of a phase of growing legal uncertainty. Politicians in their role as the regulating supervisory authority cannot keep up with this dynamism and react, if at all, after a long time-lag.

Should the state regulate the internet?

% (left: n=1,487; right n= 1,109), 2013



Sources: Institut für Demoskopie Allensbach (IfD), Dt. Institut für Vertrauen und Sicherheit im internet (DIVSI)

The language of the internet

Digital change is unstoppable and in full flow across numerous sectors, interacting constantly with the forces of globalisation. It continues to be underestimated by many – including those in the financial sector. It is the Ubers, Alibabas, Apples, Airbnbs, Googles, Amazons and Facebooks of this world that are dictating to us, the consumers, the rhythm of innovation at an impressive pace and are driving change aggressively in part, but above all equipped with ample financial resources. We are at a relatively early stage in realising the potential of digitalisation and virtualisation and can currently only guess which smart algorithms or modern analytical methods we will be faced with in our daily lives at the end of the next decade. However, in order not to cede complete control to the self-learning algorithms it is important to grasp that we can and must exert our influence now with an appropriate regulatory framework.

The formula for modern need satisfaction

The new distribution and communication channels are also resulting in changes to customer demands. Customers are therefore demanding modern and contemporary products and services. For all providers, not only of (digital) services, the unwritten law that therefore applies is that the consumption behaviour of many internet-savvy and increasingly also of traditional consumers varies extremely fast and constantly adapts to the structural change. The desired services are supposed to satisfy certain requirements as much as possible. Ideally they are

- simple (intuitive) and easy to operate;
- provide fast and secure access;
- personalised and compatible with complementary services and,
- if possible, can be obtained from a single source, i.e. a digital platform.

Access is more important than ownership in the sharing economy

For a number of years now the priority of many consumers has no longer been to own (digital) products, but only to have access to them. Today we stream

¹ <http://www.welt.de/gesundheit/article123943259/Google-Labor-arbeitet-an-Kontaktlinse-fuer-Diabetiker.html>.
² <http://en.wikipedia.org/wiki/Wi-Fi>.

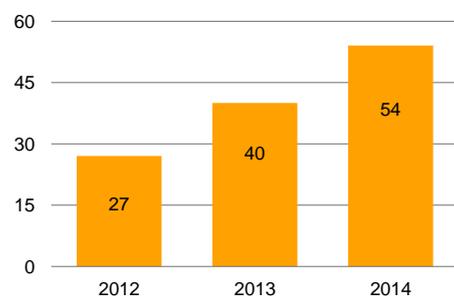


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Mobile internet use in Germany

2

% of respondents (2014: n=1,009; 2012/2013: n=1,005)



Source: Initiative D21

music and films and no longer store them on our devices. This shows that even within the process of digital structural change a marked shift in consumer behaviour is taking place. Existing, market-dominant digital ecosystems are being challenged by even newer and more innovative services (Apple/Amazon vs. Spotify/Netflix). Physical goods, such as motor vehicles, bicycles or the often mentioned drill, can also be shared without the more cost-intensive ownership status. The term coined for this growth in (digital) mobility is the “Sharing Economy”³. Its potential is reflected in the alternative business models of the Ubers and Airbnbs. Especially with the above-mentioned formula for need satisfaction increasing numbers of people worldwide and regardless of their age can be courted, served and connected via innovative internet services anytime and anywhere using a variety of (mobile) devices. Customers are addressed using the uniform global **language of the internet** and a few major internet platforms in particular boast a virtually perfect command of this language. They tailor their offering precisely to the needs of internet-savvy clients and thereby succeed in retaining billions of international users, mainly for the long term, on their (digital) platforms.

Recognise and grasp opportunities and become a digital ecosystem

The forces of digitalisation and the rapid adoption of advanced internet technologies are increasingly resulting in the international establishment of a flexible and proven corporate architecture that is increasingly being referred to as a “digital ecosystem”⁴. The digital ecosystems are known for their so-called “walled garden” strategies, which we shall describe in more detail below. The question is why digital ecosystems are enjoying such success and to what extent these tried and tested business practices and strategies would also be suitable for other firms, e.g. traditional banks. Many traditional companies and banks have their origins in the analogue world and are currently pulling out all the stops to develop their own (digital) strategies in order to remain competitive. However, they are making only slow progress and implementing fragmented siloed solutions. Digital change, however, requires fundamental structural reforms with extensive adjustments.

The age of digital ecosystems

The traditional bank as a modern, digital platform

The digital strategies of many traditional banks are too insubstantial and are incapable of remaining competitive over the medium to long term. Some business models, distribution and communication channels, products, services and processes and customer contact as well as the handling of data need to be reconsidered and redesigned. One fundamental reform that is in keeping with the digital age provides the opportunity for traditional banks to learn and above all adopt the strengths of the successful digital ecosystems. Why shouldn't banks also transform themselves into digital ecosystems in order to strengthen the ties with their customers by offering a wide range of financial services from a single source? **Established financial institutions are transforming themselves into a digital platform-based banking ecosystem.** This puts them in a position to operate with greater potency against competitors in order to stand up to the new market players from the technology-driven, non-bank sector with their own strategies. The outcome is a digital, convenient and secure financial platform for the customer with personalised services, also from third-party providers.

³ See the Deutsche Bank Research Talking point on the topic of the Sharing Economy: <http://bit.ly/1HKpOTw>.

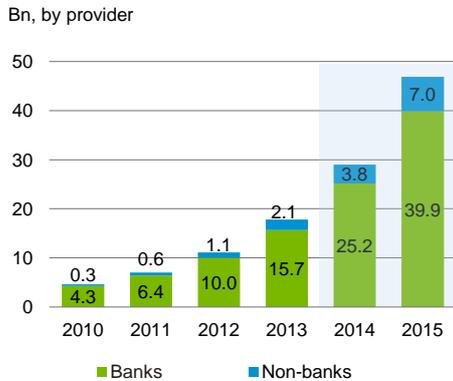
⁴ See Bahr, F. et al. (2012). *Schönes neues Internet? Chancen und Risiken für Innovation in digitalen Ökosystemen*. Policy Brief 05/12. Stiftung neue Verantwortung. Berlin.



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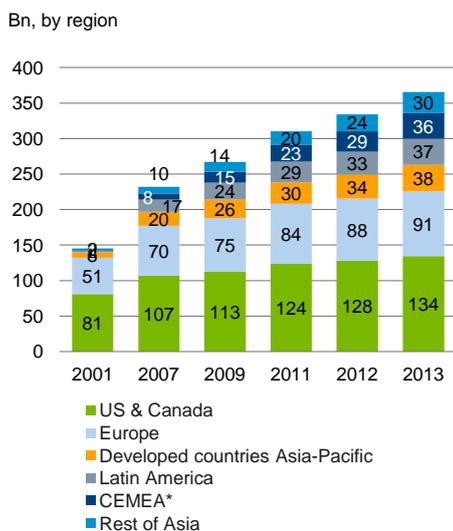
This is the road to the modern banking ecosystem

Number of mobile payment transactions worldwide **3**



Source: Capgemini Analysis

Number of cashless transactions worldwide **4**



*Central Europe, Middle East, Africa, Russia and Poland

Source: Capgemini Analysis

Having analysed both the new market participants from the non-bank sector and the accompanying opportunities, risks and challenges of digital structural change within the financial industry in our recently published report “Fintech – The digital (r)evolution in the financial sector”⁵, we follow up in this report by describing a concrete alternative solution in order to react appropriately to the (digital) developments that have been looming for quite some time. The alternative digital strategy or the transformation of traditional banks into banking ecosystems is supposed to enable the established financial institutions to bolster and then re-expand their position in the changed competitive environment.

The following chapter provides a brief summary of the strategies, strengths and weaknesses of the major internet platforms that we all know, but also of many agile fintech start-ups and niche providers. The focus is trained particularly on the monetisation strategies (walled gardens) of digital ecosystems. In its analysis of the individual strategies the report shows the extent to which the platform providers' individual business practices could be adopted and/or implemented almost completely by traditional banks. Chapter 3 outlines the major challenges currently facing the traditional banks due to digital structural change. At the same time, however, the reform efforts also offer many opportunities. Among the recommendations are measures to (re)gain trust, deployment of open developer interfaces and advanced key technologies as well as bundling the skills of various market players via strategic alliances.

The major challenge of the newly emerging platform-based banking ecosystem is presented in chapter 4. The focus is on several concrete, intuitive financial services that can be accessed by (not only) internet-savvy customers within a secure IT architecture. The interaction and linking-up with a bank's own data and algorithm-based financial services play just as big a role in the ecosystem concept as the transparent and varied financial services offering of third parties via an integrated banking app store. What becomes particularly clear is the potential of compatible technologies, such as for example speech recognition and the importance of collaboration. Both aspects offer the opportunity of also launching financial products that are widely accepted and robust within the banking ecosystem. The report ends with concluding remarks and a brief outlook in chapter 5.

2. Strategies, strengths and weaknesses of digital ecosystems

The necessary strategies discussed in this report come from the realm of those successful major internet platforms that conceived, constructed and expanded their business models on almost completely digital lines from the very beginning in some cases. These business approaches serve as best practice for established banks and some of them can, for example with regard to data protection or the use of open technology standards, be optimised and even be deployed in a more customer-friendly manner. Here the focus is on all products, services and processes that are easy to standardise and automate. So the main area of interest is traditional financial institutions' retail business, although it is presumably only a matter of time before corporate clients and institutional investors will also be supplied and courted with simple data-based and algorithm-based financial services by new vendors. Many advanced web and algorithm-based services from the retail business can also be deployed in the corporate client segment or the B2B segment⁶, but they are not included in this

⁵ Dapp, T. (2014). Fintech – The digital (r)evolution in the financial sector. Deutsche Bank Research. Frankfurt am Main.

⁶ <http://en.wikipedia.org/wiki/Business-to-business>.



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Digital ecosystems provide us with “smart everything”

5

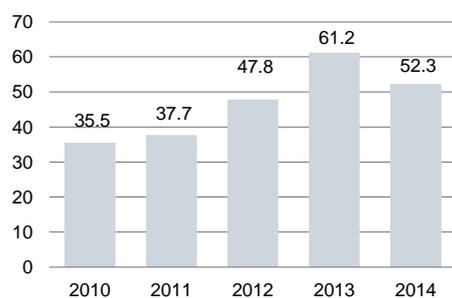


report. The implementation of monetisation strategies is also suitable for non-financial sectors, such as the music business, publishing, insurance, the automotive industry, education and the healthcare sector. After all, many sectors are currently undergoing the transformation process prompted by digital structural change. They are all searching for appropriate solutions for adapting their business models to the modern era. They can all utilise advanced key technologies, such as algorithm and data-based, cognitive, self-learning systems, in order to retain more customers. The transformation into digital and open platforms therefore represents an attractive and lucrative solution, even though the reform of existing structures requires far more effort than starting anew from scratch.

Apple Inc.

6

USD bn, liquid funds



Source: Apple Inc. Annual Reports

2.1 The strengths of digital ecosystems

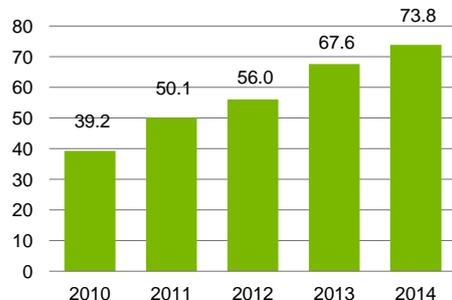
The success of some internet platforms with strong market positions cannot be ignored. Their business models are often accompanied by strong sales and earnings growth and enable them to speed up the process of developing many innovations, projects and investments to market readiness. The liquid funds at their disposal are so vast in some cases that some internet giants are extending their antennae into other sectors and investing billions of euros in what were hitherto non-core activities.

The pipeline with innovative projects or business models appears to be well filled since the frequency with which new services and products are launched, or the innovation rate, is certainly higher than at many established firms founded back in the analogue era. The latter still face daunting challenges and are adapting their business models to the digital age, successfully in some cases and sluggishly in others. Many established firms in various sectors are feeling the impact of the same competitors in segments of their core business. It is particularly technology-driven market players that have managed to establish themselves successfully due to digital structural change and have shaken up one sector after another at differing speeds but with similar levels of intensity. It is not uncommon for the perennially successful business models of established companies to be called into question in their entirety. The same internet technologies are being used across all sectors, though. The challenges are based on the intelligent interplay between automation, self-learning algorithms and cognitive systems.

Google Inc.

7

USD bn, liquid funds



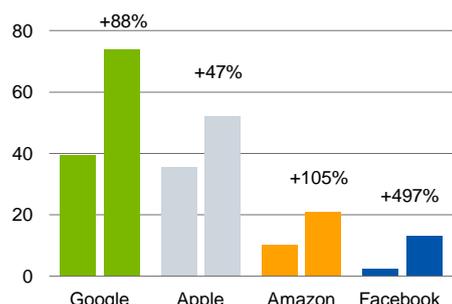
Source: Google Inc. Annual Reports

It is, however, not only the major internet platforms who are probing into numerous other sectors. From a macroeconomic point of view the efforts of many start-ups and niche players (e.g. crowdinvesting and lending platforms, micropayment providers) are also to be welcomed as their nimble market entries generate the necessary innovative stimulus to the competition for internet-based technologies. Furthermore, many start-ups and niche operators are actively seeking strategic alliances with larger firms in order to take advantage of the latter's infrastructure, expertise and customer reach. The ultimate beneficiaries are not only the internet giants, the established firms and the start-ups, but also consumers, because the range of products and services available is becoming more diverse – something of a “win-win-win situation”.

Digital ecosystems have sufficient liquid funds

8

USD bn (bar chart reading: change between 2010 and 2014, %)



Sources: Annual Reports, Deutsche Bank Research

Why are digital ecosystems so good at locking in their customers and suppliers both horizontally and vertically along their value chain? It is the case that digital ecosystems are in direct competition with one another in more and more business areas despite their differing business models, sources of revenue and competences.⁷ They all have the same objective. They integrate a large volume of digital content, mobile devices, software and internet services under a single

⁷ Kaufmanns, Dr. R. und Siegenheim, V. (2012). Apple. Google. Facebook. Amazon. Strategien und Geschäftsmodelle einfach auf den Punkt gebracht. Digitalkompakt #05. Landesanstalt für Medien Nordrhein-Westfalen (LfM). Dusseldorf.

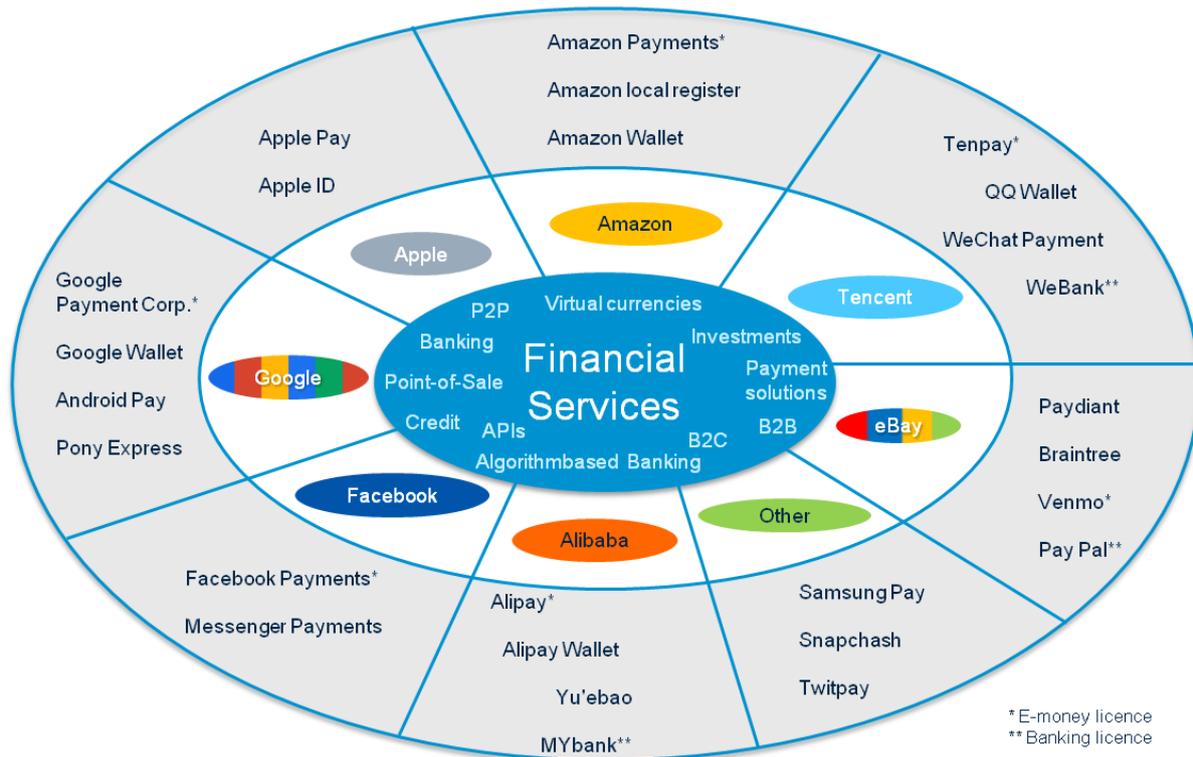


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umbrella so that their customers ideally no longer have to leave their platform. The platform providers thereby strengthen their own market position, increasingly expand their business activities beyond their core competences in order to cement their growth over the long term and ensure that their own technology standards become established within their systems. With a customer reach that should not be underestimated and their successful monetarisation strategies (walled garden) many of these technological standards have become established and especially so in the international arena.

The range of international financial services offered by digital ecosystems is expanding

9



Source: Deutsche Bank Research

2.2 The concept for success: The walled garden strategy

Walled garden is a term used for a technology concept to describe a delimited corporate environment. The concept signifies a business model in which the manufacturer attempts to use exclusive distribution models to retain control over software, mobile devices (generally hardware) and content, which are only made accessible to a specific group of customers (toll good⁸). The relevant decision-making criteria when customers are choosing the services and products of one digital platform including the time saved, convenience, IT security and a manageable degree of technological complexity allied to the desire to be able to consume new technologies and/or innovations at frequent intervals. Since the products, services and hardware can be monetarised more easily inside walled gardens than in open corporate structures, segments of the internet are set to remain walled gardens permanently. Compared with the traditional, platform-neutral internet the main arguments made in favour of walled garden strategies include convenience, security and monetarisation⁹:

- *Convenience*, because – as in the example of Amazon – based on the knowledge of their customers' consumption habits personal buying tips can

⁸ Toll goods are those goods whose consumption is excludable and for which the rivalry in consumption is low.

⁹ See Bahr, F. et al. (2012). Page 4.

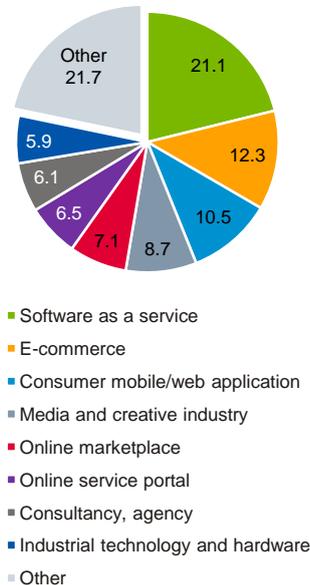


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Start-ups are dominated by software as a service

10

% of start-ups surveyed in DE by sector and market (n=903), 2014



Source: Deutscher Startup Monitor 2014

be generated for books, music, etc. via recommendation algorithms. Google in turn benefits handsomely from the fact its various services are compatible with one another and are delivered from a single source and in a user-friendly way. In very general terms the walled reduction in complexity allows a more convenient dovetailing of different services. The associated user-friendliness and time saved as a result also increases the user's willingness to pay. The longer that a subscriber remains on an individual platform and the more convenient this stay, the higher the monetisation potential.

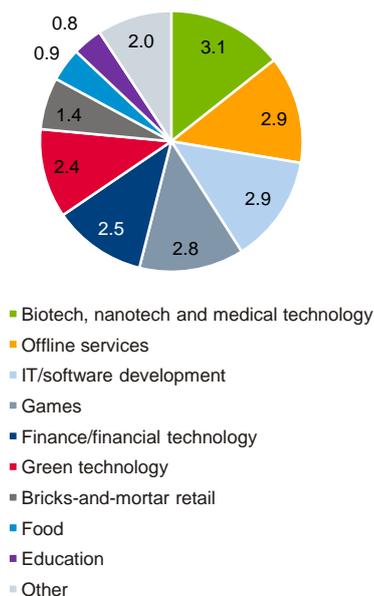
- *Security*, because it is easier to implement protection against malware inside a walled garden. The more closed an ecosystem is from the rest of the internet, the easier it is to keep out malware and other security risks. Especially because the broad range of major ecosystems is leading to an increase in the volume of sensitive personal data, this security dimension is growing in importance.
- *Monetisation*, because open systems for example battle against a high percentage of illegally copied apps and also it is more difficult to link them with supplementary services (e.g. payment services). If the critical mass of users is achieved, closed platforms can be more attractive for third party vendors, because services are easier to monetise. However, this can be accompanied by restrictions on the freedom to structure the services. A certain degree of restriction thus provides advantages with regard to monetisation for both platform operators and third-party vendors.

Walled gardens, however, do also contradict to a certain extent the interests of developers and users who would like to decide for themselves how they have long-term access to the hardware and technology they have acquired. After all, an offering in a walled garden system is designed in such a way that switching to a different platform can be relatively time-consuming and cost-intensive. This is where both the lock-in and switching-cost effects come into play.

Other sectors, markets

11

% of start-ups surveyed in DE by sector and market (n=903), 2014



Source: Deutscher Startup Monitor 2014

The aspects *convenience*, *security* and *monetisation* are of course also appropriate for traditional banks, especially for the digital accounts/online banking offered by banks. Why don't banks offer their customers similar recommendation algorithms, like Amazon and other online vendors? There is huge potential for providing customers with more extensive and useful financial services. A banking ecosystem would be in a position to fulfil these requirements and could also work with more flexible open, standardised interfaces, enabling the customer to move as freely as possible within the ecosystem and third-party providers to link up with the banking infrastructure with a minimum of fuss.

2.3 Monetisation strategies in the walled garden environment

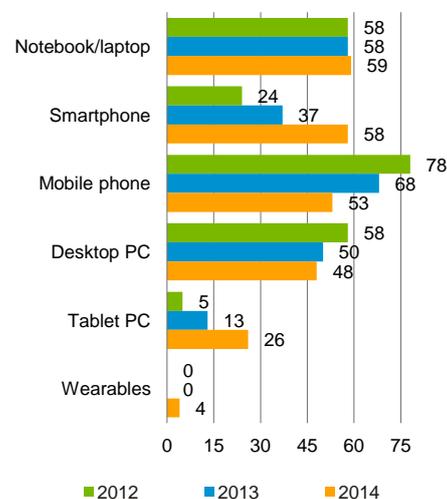
The monetisation aspect can be subdivided even further. The following monetisation strategies show which methods are used by digital ecosystems in order to a) keep millions of subscribers permanently on their own platforms and b) make the platform appealing for the services of third-party vendors as well. Also detailed are the options describing to what extent traditional banks could almost completely integrate individual strategies.



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Ownership of web-based devices in DE 12

% of respondents (2014: n=1,009; 2012/2013: n=1,005)



Source: Initiative D21

Criticism of walled garden strategies 13

Walled garden systems are popular, accepted ecosystems that are expanding rapidly. However, there is increasing criticism being voiced in the debate about whether they control innovation, communication and information flows and undermine data protection rules and user autonomy. Furthermore, critics point out that user activities are logged for undisclosed monetarisation purposes using intransparent methods.

Walled garden users now constitute the majority of internet users. Evidently, consumers are prepared to cede some of their freedoms to the platform operators in order to consume their preferred internet services via a convenient single source. Users' demand for convenience is also so high that they raise no objections before revealing personal and intimate information, they allow this information to be passed on to third parties, they permit the clandestine storage of biometric voice and facial scans and they put up with personalised advertising messages each time they surf online.

Critics emphasise that there is increasing evidence to back up the suspicion that internet users themselves are becoming tradable goods.

2.3.1 Interoperability and open interface policy (APIs)

Interoperability¹⁰ as well as non-discriminatory standardisation between heterogeneous technical systems have always been a guiding principle for the development of the World Wide Web. Application programming interfaces (APIs¹¹) are increasingly used as a traditional platform strategy to tie third parties with other niche offerings to the proprietary ecosystem. In the early phases third parties and programmers are encouraged with the aid of open, standardised APIs to build their own services and applications based on the respective platform.

For this traditional banks could for example regularly conduct hackathons¹² and impartially experiment with innovations in the financial sector as part of an ideas competition.¹³ Alternatively, banks could inaugurate a central innovation lab and give external algorithm operatives project-based assignments to analyse the full internal and external data potential, in order for example to develop new business ideas, technologies and financial services for clients or to structure internal processes more efficiently. Open APIs are a prerequisite for a seamless connection between interfaces, services and applications (apps), so that digital content can be accessed inside and outside existing websites. For example a myriad of social apps such as social games, widgets, mashups and social plugins (e.g. the "Like" button) are provided so that internet users can communicate and play with one another and make comments and recommendations to each other on the respective platform. Using open APIs provides the ecosystems with two key benefits: firstly, the external applications create new potential uses for consumers, while the platform operators forge bonds with the developer community and generate additional lock-in effects.¹⁴ Secondly, the appeal of the ecosystem's services also increases if complementary offerings enhance the customer benefits.

Open structures and interoperability as instruments of the walled garden strategy benefit innovation, especially in the area of information and communications technology (ICT). They can lead to increased efficiency, productivity and growth at the macroeconomic level. Nevertheless, interoperability between digital ecosystems is also limited by oligopolistic practices. Over the last few years it could be observed that major platform operators made a strategic decision against interoperability in order to exert better control over information flows spread virally by users and to monetarise them (in future).¹⁵

2.3.2 Lock-in effects and switching costs

A lock-in strategy seeks to establish a technological link between the hardware and the software as well as numerous internet services in order to increase customer loyalty even further. Within an ecosystem the lack of interoperability, proprietary software and different technological standards are making it

¹⁰ Interoperability is the ability of differing systems, technologies or organisations to work together. This usually requires compliance with common standards. If two systems can be joined together, they can also be described as being compatible.

¹¹ A programming interface, or to be more precise an application programming interface (often referred to by its acronym API), is a programming component that is provided by a software system to link up other programmes to the system. See: http://en.wikipedia.org/wiki/Application_programming_interface.

¹² <http://www.hackevents.co/>.

¹³ <http://jugendhackt.de/>.

¹⁴ All the same, the ecosystem more or less determines the course, because it can often fall back on a loyal clientele of millions and boast high market shares, whereas third-party vendors can benefit from and share in the income generated by existing infrastructures and especially from the data of millions of clients.

¹⁵ This of course diminishes the user experience because linking up with other platforms is impossible. Some platform operators limit and control media flows deliberately in order to limit the interoperability with competitors and improve it with collaborators, by contrast.



increasingly difficult for the end-consumer to utilise services from third parties that are not geared towards the standards and restrictions of the ecosystem. The switch to another ecosystem can thus become a cost-intensive exercise, because the lack of the necessary interfaces or technological standards prevents the linking-up of different services and/or devices.

A digital payment process of its own in the banking ecosystem

In the banking context, for example, the offering and the integration of an innovative (mobile) payment system within the banking ecosystem should considerably boost the lock-in effect and prove an effective tool for tying the customer even more firmly to the platform. Also, it would be possible, for example, to let external retailers bolt onto the value chain of the banking ecosystem, assuming that users accept and utilise the payment system. This would allow the easy linking-up of local or regional customer loyalty programmes that entice customers with attractive supplementary offerings. Customers could thus make digital payments from their secure online bank account at various retailers via mouse click, touch or voice activation, without again having to go through the time-consuming procedure of entering their personal payment data on the respective retailer platforms. In addition to the options “*invoice*”, “*credit card*”, etc. the retailer's platform would also display the payment option: “*debit from customer's bank account*”. Amazon offers precisely this service, for example.¹⁶ However, this requires suitable, open programming interfaces and the collaboration with retailers.

2.3.3 Cross-subsidisation

Another (monetisation) strategy employed by platform operators is cross-subsidisation. Cross-subsidisation means that individual business or product areas are subsidised by others. Providers offer purchase incentives by squeezing the prices of mobile devices for example down to their cost price. Many products are sold particularly cheaply to gain as many customers as possible and thereby further increase market share or to undercut the prices of competitors. Many smaller, established providers cannot afford to do this (permanently).

The example of the Kindle Fire shows how Amazon is speculating that internet users who own a mobile device will purchase more digital content (books, music, films, e-books etc.) via its own platform. Jeff Bezos, the CEO of Amazon, said in this connection: “*We are not building devices for technology freaks. We are building devices for people who like to consume and use media. We don't want to make money on the devices, we sell them at cost price and hope that we then make money from the Amazon offering that is linked to the devices. That is films, books, newspapers, games and apps.*”¹⁷

Selling the device at cost price or even slightly less can prove to be lucrative. The profit is thus not made directly from the sale of the tablet or smartphone, but from boosting online sales via the new device exclusively in its own content store (premium media content, own TV productions, etc.). Given the variety of products, exclusive services and (billing) processes in the Amazon offering this strategy is bearing fruit. The principle of cross-subsidisation is not really a new one and is seen as a strategic competitive tool in many industries. Using cross-subsidisation becomes a problem when it results in the retention of inefficient structures and increases intransparency.

Exclusive devices with bank branding

Traditional banks could also consider supplying their customers with mobile devices (smartphones, tablets, wearables) made by other manufacturers with the bank's own branding at low cost or perhaps free of charge, in order to

¹⁶ <https://payments.amazon.de/customer>.

¹⁷ <http://www.berliner-zeitung.de/magazin/amazon-gruender-jeff-bezos-gedruckte-zeitungen-leser-ich-nicht-mehr,10809156,20945666.html>.



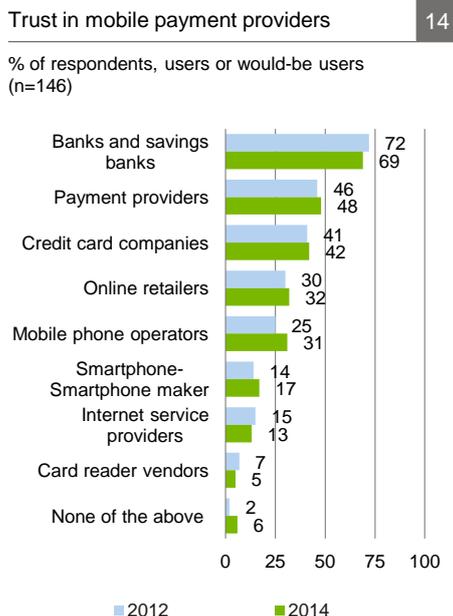
Fintech reloaded – Traditional banks as digital ecosystems

monetise additional financial services via the banking app store and to establish closer links with the customer. This offers a lot of potential for exclusive inhouse banking services that might be positioned in the higher-priced segment, such as an interactive customer network in the area of art or real estate with special advisory services.

2.3.4 Strategic alliances

Digital ecosystems are locking horns with one another with increasing intensity. One probable scenario for the future is that market participants will become increasingly willing to enter into other strategic alliances with one another or with third-party providers via suitable programming interfaces in the value-added network. This would generate synergies and overlaps with respect to size, reach, customers and integration opportunities. This will make many things easier from the user's point of view. While, for example, the PC with an operating system becomes less and less visible, the ecosystem as a whole with its numerous internet services will take centre-stage. The simplicity and the convenience demands of users are, however, accompanied by an oligopolistic structure of the digital ecosystems. This provides the established banks with opportunities to collaborate not only with their peers, but also with big internet platforms and small niche operators or the much discussed fintech start-ups. They are all operating in the market for digital, data-based and algorithm-based banking. In this connection it is conceivable that there will also be strategic partners that can expand the range of digital and mobile financial services with complementary offerings. The entire retail sector provides suitable potential collaborators for a digital, mobile payment system or for appealing customer loyalty programmes as another element of the new digital banking ecosystem. The financial services available from the banking app store ensure that ultimately the consumer also always benefits from a more diverse range of inhouse and third-party financial services.

When one party's weaknesses become the strengths of the other



Sources: Initiative D21, TNS Infratest

2.4 Shortcomings of existing digital ecosystems

Digital ecosystems also have vulnerabilities that the established banks in particular should exploit as a strength and incorporate in their respective strategies as a potential unique selling proposition:

Firstly it is not uncommon for the well-known digital ecosystems to use their own operating systems, which does not usually allow the consumer to switch from one ecosystem to another without incurring high switching costs.¹⁸ The number of providers of these relevant operating systems is, however, quite meagre in relation to market share. Which suppliers ultimately implement which technologies in the market for (mobile) financial services (e.g. a digital payment system) thus depends very heavily on the existing system infrastructures, and thus in this case on the operating systems such as iOS, Android, Windows, etc which are embedded in mobile devices. When customers are in the Google world for example and are using the Android operating system with an Android-compatible mobile device, they cannot then simply use mobile internet services from the iOS Apple world, unless the underlying software is compatible with several operating systems. This, however, usually contradicts the walled garden

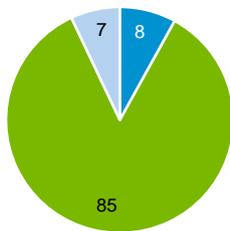
¹⁸ In some cases the operating system used has some rights restrictions attached to it (DRM, digital rights management). In order to circumvent these interoperability barriers the security vulnerabilities of the devices can be exploited (Jailbreak, Rooten) to outwit the operating system's protection mechanisms (DRM). As a rule, however, this invalidates the warranty and guarantee protection as well as the technical support from the provider, which can send the costs for the consumer rising even more sharply.



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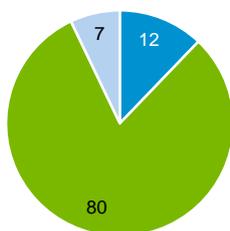
Fear of fraud in online banking in 2014 15

% of respondents (users n=755)



... and in 2012?

% of respondents (users n=786)

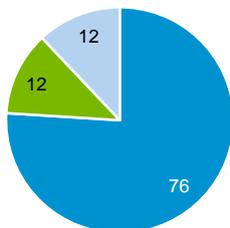


■ Yes ■ No ■ Don't know/NA

Sources: Initiative D21, TNS Infratest

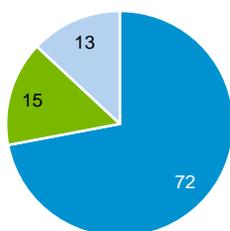
Fear of fraud in online banking in 2014 16

% of respondents (non-users n=184)



... and in 2012?

% of respondents (non-users n=158)



■ Yes ■ No ■ Don't know/NA

Sources: Initiative D21, TNS Infratest

strategy of the ecosystems. After all, for many consumers when it comes to their financial affairs it is their bank in which they place their trust.¹⁹

Secondly, German politicians²⁰ and data protection experts²¹ for example are critical of the often rather lax attitude to data protection that prevails among the big US platform operators. If the big digital platform operators were also to comply credibly and above all sustainably with the relatively strict German data protection standards, i.e. protecting personal data (that is the informational self-determination of the consumer), it would be far more difficult for the established firms to expedite their catch-up process. Particularly in this regard there is thus a real comparative advantage for the established parties and especially for the banks that should definitely now be used to (re)gain customer trust.

3. The challenges facing traditional banks

“The best example of what technical interoperability can achieve is the internet. Its open architecture enabled billions of users all over the world to access interoperable devices and applications.”

[Digital Agenda for Europe, 2010, European Commission]

The pressure is growing for traditional banks. They now need to respond promptly with their own strategies given the changes to and the growing intensity of the competitive environment, the technology-driven firms entering the market and the threat of market consolidation. The earlier they offer solutions of their own, the likelier they are to participate in and actively shape the market with their own digital services.

It is especially the innovative financial services from the non-bank sector – first and foremost the data and algorithm-based financial services – that the banks need to respond to with their own corporate services that are in step with the digital age. This is the only way they can succeed in catching up with the new market participants and achieving a trusting relationship with an ever expanding share of internet-savvy customers who have been spoilt by the platforms.

Despite the very tight squeeze on some margins, the fallout from the financial crisis, the changing consumption behaviour of customers and the increasingly stringent regulatory requirements banks now need to invest more in digital technologies and adapt comprehensively to the modern internet age. The main challenges are for the established banks to develop primarily into a digital, platform-based ecosystem themselves and at the same time to impartially consider entering into potential strategic alliances with external financial service providers **along their entire value chain**. Furthermore, other aspects should be taken into account and implemented in the transformation strategies with the minimum of disturbance.

3.1 (Re)gain trust

One of the most important aspects in settling and processing financial transactions is security and the protection of personal data. The loss of data inside a bank, especially the personal data of a customer, may be judged by many people according to different standards compared with the loss of data by a company from outside the financial sector. In the worst case leaks of personal data in the financial sector can end up with the customer permanently ending

¹⁹ Initial steps can be observed in Germany: <http://www.sueddeutsche.de/wirtschaft/bezahlen-im-internet-deutsche-banken-machen-paypal-konkurrenz-1.2368805>.

²⁰ <http://www.spiegel.de/politik/deutschland/facebook-justizminister-heiko-maas-kritisiert-neue-datenschutz-regeln-a-1015899.html>.

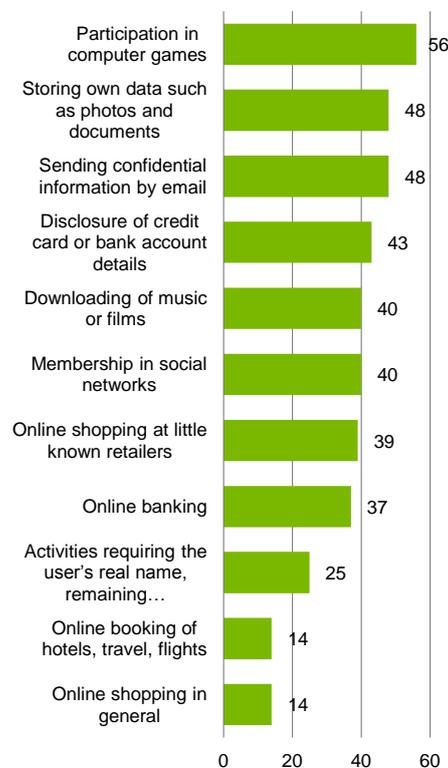
²¹ See Weichert, T. (2012). Datenschutzverstoß als Geschäftsmodell – der Fall Facebook. <https://www.datenschutzzentrum.de/facebook/20120921-facebook-geschaeftsmodell.pdf>.



Fintech reloaded – Traditional banks as digital ecosystems

Abstinence for security reasons 17

% of German population over 16 (n=1,487), 2013



Sources: Institut für Demoskopie Allensbach (IfD), Dt. Institut für Vertrauen und Sicherheit im internet (DIVSI)

the relationship with their bank because the necessary trust has been lost. In order to maintain the relationship of trust between bank and customer with regard to (personal) data over the long term, traditional banks invest a lot of resources in securing data, systems and processes. Traditional banks should therefore recognise that their customers' confidence in data security and in data protection is a comparative advantage and actively communicate this in the framework of cautious marketing campaigns.

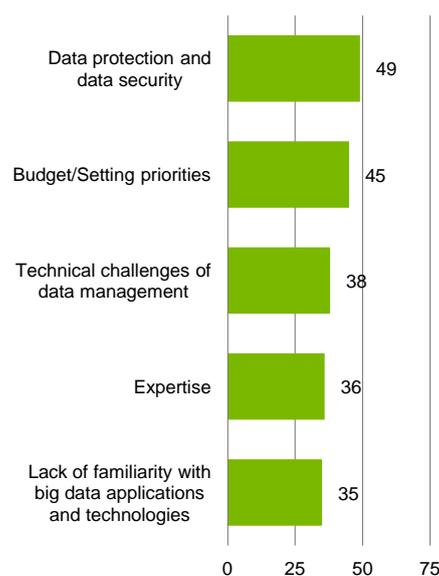
After all, handling personal data prudently and responsibly is a valuable confidence-building measure especially in the digital age. These confidence-building measures will in future decide whether the outcome is success or failure in many sectors and not only in the online market. Only those who can convince clients lastingly and credibly that their data is secure, i.e. that it will neither be sold to third parties nor used for other non-business projects, can (not only) continue to exist in the financial market, but even generate growth. This opportunity is also such a hot potato for banks because some data practices of major (US) platform operators are worrying particularly given the stringent German data protection standards, and the topic of data security has in the meantime been reassessed not only by many users but also by many non-users.²² In future it will be particularly important to also win over non-users/digital banking refuseniks.

Data security and data protection gaining relevance

Since many digital transactions as well as the accessing of data on desktop computers in households and companies have migrated to the cloud and mobile devices are increasingly the means of access, IT security is becoming more and more important in both the private and business arenas. No doubt, the awareness of IT security vulnerabilities resulting from the release of the Snowden documents in June 2013 was an additional driver of an increase in uncertainty and the feeling “of no longer being alone” online. There is virtually no other IT issue at present that is so contentious across the generations than the question of data security and informational self-determination. This is now an important issue for the banks, because especially when it comes to sensitive financial data, customers are rightly worried with regard to the eavesdropping activities and data abuse perpetrated by some institutions.

Key challenges in the field of big data 18

% of respondents (n=82*), 2012



*SMEs and large companies from various sectors

Source: Fraunhofer IAIS

3.2 Learn and use modern data analysis (big data)

Above and beyond these issues a key point is that traditional banks should satisfy the needs of their internet-savvy customers in future and increasingly use the [language of the internet](#) to do so. For this it is necessary, for example, to revisit current ways of handling (client) data within the framework of applicable data protection rules in order to deploy new algorithm-based analytical methods that filter additional valuable information out of existing and/or supplementary new data. After all, a fact that people often underrate in the digital debate in the financial sector is that traditional banks possess huge volumes of valuable data harbouring considerable potential for new ways of communicating with customers, for instance. As a rule, the current account is the key interface linking banks and their customers, i.e. traditional banks have many valuable behavioural patterns on record (in terms of payments, consumption, propensity to save and invest, risk aversion, travel preferences etc.). Therefore, it makes sense for them to apply the same data evaluation strategies as the large internet platforms so they can also offer their customers convenient, one-stop

²² Kaufmanns, Dr. R. and Siegenheim, V. (2012). Apple. Google. Facebook. Amazon. Strategien und Geschäftsmodelle einfach auf den Punkt gebracht. Digitalkompakt LfM #05. Landesanstalt für Medien Nordrhein-Westfalen (2012). Dusseldorf.

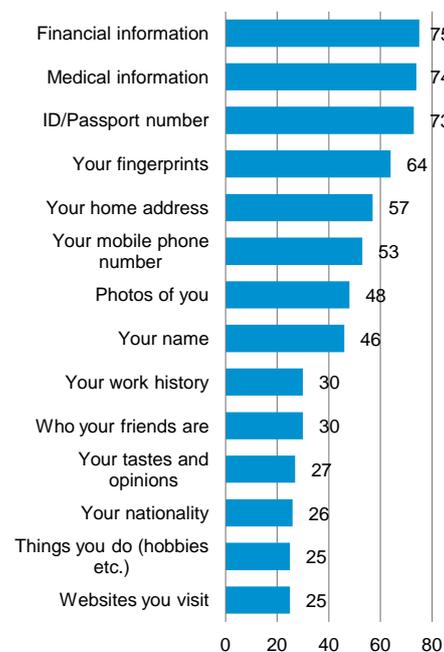


Fintech reloaded – Traditional banks as digital ecosystems

Which of the following types is personal data?

19

% of respondents, EU-27, 2011 (n=26,574)



Source: European Commission

Explain to customers how the algorithm works

More transparency in the black box of big data

shopping for as many value-added services relating to their finances as possible. After all, intelligent data analyses are the only way it will be sustainably possible to a) maximise customer utility and b) make internal infrastructures leaner and more efficient.

Experts estimate that today only 15% of all globally available data are structured and about 85% unstructured²³, i.e. much of the data held by a traditional bank is also unstructured. To cope with the steadily growing volumes of data and the modern algorithm-based analytical methods, the first step banks will have to take is to harmonise all available types of data, i.e. make them machine-readable. It is especially challenging, technically, to convert audio, video and picture files in particular into uniform machine-readable data. The underlying algorithms need, for example, to understand and transcribe one or more languages besides recognising faces, company logos and copyrighted digital content.²⁴ This is the only way to combine different data volumes and types with new data sets and detect potential patterns in this agglomeration of data using intelligent software programmes. Only then do the modern analytical methods, as described in the big data debate in many quarters, deliver their much vaunted benefits also for banks. However, traditional banks are still a long way from achieving this.²⁵

The customer has a right to data sovereignty

Traditional banks should increasingly use modern analytical techniques with the mandatory consent of the customer and transparent communication channels to derive additional insights from the personal data provided by the customer. Transparency measures help to overcome customer mistrust and minimise data protection infringements. Transparency should cover all steps of analysis, that is not only the collection of data and its fusion with other data sets but also the actual analysis itself and any subsequent use of the findings. In this context, communication must be simple and understandable so that customers can follow the individual steps and select them at will.

Pages of complicated “General Terms and Conditions” in complex legalese and small print, and perhaps paper-based at that, are not exactly a good model to fall back on. Customers have a right to know what will happen with all the data collected on them and to decide on their data sovereignty themselves.

Therefore, banks should lead the way in allowing customers to indicate their choices on a short, simple (digital) application list stipulating what should happen with their personal data and which algorithms should be used. There has to be a guarantee that any change of the general terms and conditions desired by the customer can be granted at any time. It is fitting here for banks to address their customers personally in order to inform them and raise awareness of related issues. Incidentally, confidence-building measures on the transparency of business terms and contractual agreements should apply to all companies, also those outside the banking sector.

Traditional banks could assume a pioneering role in this respect. Naturally, a stringent regulatory regime compels them to comply with certain data protection aspects ex ante. However, additional self-imposed, i.e. voluntary, measures, such as communicating how the underlying algorithms work, could enable the banks to make their analysis practices even more transparent, in contrast to many internet platforms. These confidence-building measures give the customer

²³ TNS Infratest GmbH – Geschäftsbereich Technology: Quo Vadis Big Data – Herausforderungen – Erfahrungen – Lösungsansätze, 2012.

²⁴ See: Heuer, S. (2013). Kleine Daten, große Wirkung. Big Data einfach auf den Punkt gebracht. Page 12.

²⁵ See: Dapp, T. (2014). Big Data – the untamed force. Deutsche Bank Research. Frankfurt am Main.



Fintech reloaded – Traditional banks as digital ecosystems

the possibility of having informed and self-determined knowledge of what happens when (personal) data is passed on and/or agreeing to an analysis that can maximise customer utility in terms of financial services. This can also help to overcome the “black box” character of big data.

A fair regulatory framework applicable to all stakeholders

At this juncture one must not forget that for regulatory reasons established banks are not allowed to correlate personal client data from one business division with their data from another in order to possibly gain new insights from the newly acquired data sets. Banks have to observe compliance guidelines which have to ensure that there can be no exchange of information between individual business divisions managed by different functions. This combats a potential conflict of interest (Chinese walls). Of course, these strict regulatory guidelines also apply to the underlying IT systems and (customer) data sets. For the new competitors from the non-bank sector in particular, however, this aspect is scarcely a factor. This means that digital ecosystems still have a knowledge lead here in information terms. It follows that for regulatory reasons traditional banks permanently lag one step behind in the catch-up process. So what is required is a regulatory environment that provides fair rules and a level playing field. This is the only way to guarantee that individual market players are not given preferential treatment to the detriment of traditional banks. So as long as traditional banks guarantee that they will neither monetarise personal data by selling them to third parties nor misuse them for other non-business projects, they should be allowed in future – with the customer's consent – to conduct data analyses across divisional lines using the information on record. The knowledge gleaned will be used to maximise value added for the customer. Discussing the issue with customers in advance and documenting their consent will ensure the confidence-building transparency required to comply with data protection legislation on informational self-determination.

3.3 Herculean task: The actual transformation into a digital platform

The reform measures that have become necessary confront traditional banks with perhaps their biggest challenge to date: to remain competitive, banks now have the opportunity to turn their business model into a platform or a digital banking ecosystem. This would enable them to satisfy the requirements of the digital era in the most timely fashion possible, but above all with technological flexibility. The transformation should ideally cover a bank's entire value-added structure, not strictly retail business, and ideally culminate in a convenient, secure and interactive financial platform with community character.

The power of the internet continues to be underestimated

There are signs at present that many companies from the various sectors, including traditional banks, may be underestimating the Herculean challenge of “going digital”. Initial reforms and/or innovations at traditional banks are visible. But the process of adapting to the digital age is in some cases only unfolding at the customer front-end of value creation, within certain business divisions, such as online banking for retail customers with useful web-based services, the use of biometric recognition software or further proprietary (digital) financial services. The strategies being used and communicated continue to be driven along the lines of the traditional but no longer contemporary silo principle.

There is, however, much more to this topic. The banks will not achieve resounding success using such methods. In future, however, it will not suffice to innovate only individual products and services. An appropriate digital strategy,

Banking-sector innovation processes
continue to reflect silo principle



Fintech reloaded – Traditional banks as digital ecosystems

i.e. that maps out the transformation process into a digital business model, can only be implemented successfully by adopting a comprehensive approach. All of a company's business divisions need to be included, and they must provide suitable internal and external (preferably open) programming interfaces for the adoption of new technologies. It is not enough to equip individual business divisions or individual sales channels with internet technologies in isolation. After all, digital transformation not only changes corporate communication. The impact is felt by all internal and external divisions, such as R&D, sales, service, quality management, legal and compliance as well as human resources and marketing. So all internal administrative and back-up processes also count.

The answer to technological complexity: Cognitive, self-learning systems

Here's where the much-vaunted use of big data can develop its full potential

A gradual opening of the value-added structure via appropriate APIs and the synchronisation of existing systems and processes are mandatory prerequisites for future technology adoption and the use of modern data analysis. Not only the use of compatible and interoperable technologies but also a further objective should enjoy high priority: traditional banks' valuable data records, that is both structured and unstructured data, must be recognised (machine readable), evaluated and upgraded. The combination of automation and deployment of self-learning algorithms enables the user's own data sets to be used more efficiently to generate new products, services and processes. What this boils down to is that in future cognitive, self-learning systems will be essential for technologically valuable decision-making support. This will enable recognition of valuable correlations in customer campaigns, for instance. On this basis, customer groups with similar behavioural patterns and similar preferences can be identified (cluster analysis). In the end, customers benefit by being addressed individually in respect of diverse financial services. On the basis of their already known habits it is possible to satisfy new needs (also ones they had not yet imagined).

Support in the area of risk and/or regulatory requirements

Cognitive, self-learning systems can also be used in internal areas, such as for regulatory requirements or in risk management. Statutory requirements, for example, are automatically reviewed for their impact and implementation. Subsequently, the new or amended regulatory requirements are automatically deployed in the respective business divisions.²⁶ In risk management regulation-induced audits can also be automated. Given the generally growing degree of regulation in the banking sector cognitive systems can thus shorten cost-intensive processes in the medium to long term and hence make them more efficient. Moreover, the use of self-learning systems guarantees that outcomes are continually improved and become more intelligent with every interaction. These systems will not completely replace humans, but will offer valuable support in areas of increasing complexity.

The new demands arising due to modern technologies (not only) in the banking sector can only be stimulated via newly acquired competences from the fields of information technology, algorithms, mathematics, artificial intelligence etc. These united areas of expertise ensure that the value of existing data is newly defined, so that going beyond them it is possible to generate new data and algorithm-based services and business models. Everything is focused on the interaction between humans and artificial intelligence running as synchronously as possible.

Incidentally, cognitive systems no longer belong to the realm of science fiction and have already reached the mass markets. The best-known cognitive services

²⁶ BANCALIS, for instance, is working on a comparable business model. See: <http://www.bancalis.de/>.



Fintech reloaded – Traditional banks as digital ecosystems

Speech recognition software in everyday use

based on artificial intelligence go by the names “Siri²⁷”, from Apple, and “Google Now²⁸”. In both of these cases the service is a biometric software connected with the internet that recognises and processes naturally spoken language and can thus fulfil the function of a personal assistant. The speech recognition programme acts as a personal assistant by supplying appropriate answers to questions or commands from the user which would otherwise require manual inputs. Its particular benefit is that the device can be operated using speech recognition software without eye contact for relatively complex tasks. Comparable software would no doubt also be a good fit for the banking ecosystem. More on this subject may be found in the following chapter.

4. The digital banking ecosystem

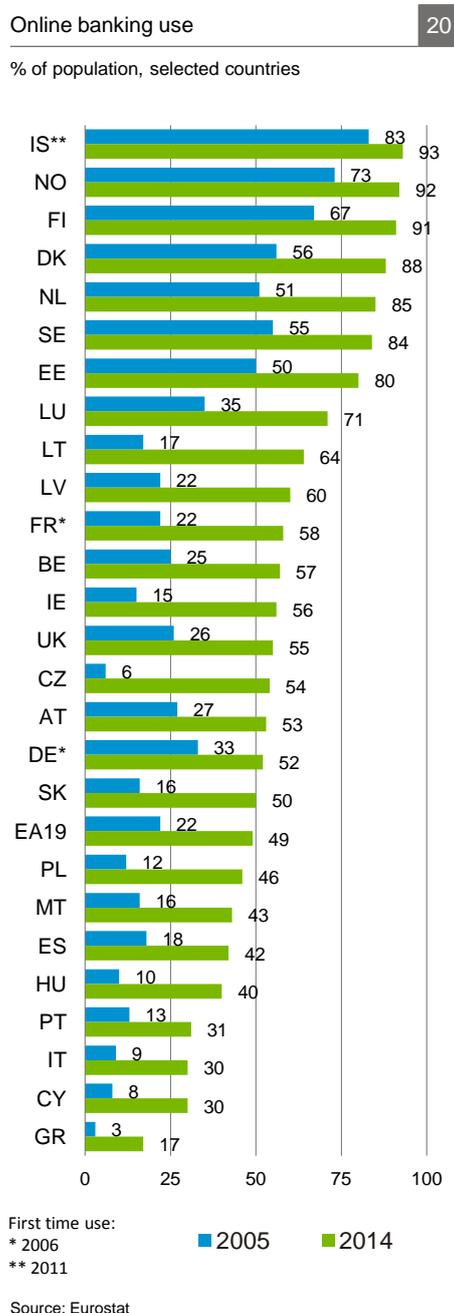
Against the backdrop of emerging digital ecosystems and their successful walled garden strategies the financial industry would be well advised not only to keep an eye on the big internet firms, but also to check whether those proven strategies can also be implemented in their own business environment. The issue is to create a digital ecosystem of their own.

It is highly likely that many digital ecosystems will continue to expand their collaboration with credit card providers, telecommunications companies, fintech start-ups and niche providers, entering strategic alliances in order to capture further market shares in the field of standardised financial services. To minimise the impact of potential cut-throat competition on financial institutions, traditional banks should therefore jump onto the bandwagon, develop a digital ecosystem of their own with their own digital corporate services, and also become integrated in existing alliances with an open mind and/or form their own alliances.

Going it alone could possibly result in their downfall in the medium term considering the substantial information edge enjoyed by some digital ecosystems, the complex demands on modern algorithm-based banking in the digital era and the increasing costs and margin pressure generated by the changes in the competitive environment. Future competitiveness will depend on how quickly and flexibly traditional banks manage to respond to the challenges of technological progress and the innovations of digital structural change. Seamless implementation of digital processes and structures could also enable banks to boost their enterprise value, because this digital approach could make it easier and cheaper to implement strategic alliances, also ones of a temporary nature. Moreover, this would help lock in more customers to the proprietary ecosystem on a long-term basis.

4.1 The merging of different competences

Digital integration no longer gives rise to innovation only in individual, isolated fields and sectors, but increasingly also in the respective open (programming) interfaces. In future, the competence and experience of a single player in protected markets will no longer be the important factor, but instead the smart links between diverse infrastructures, skills and abilities offered by various market participants. At the end of the day, the respective collaboration efforts will also benefit consumers. This development grants them maximum utility, because the diverse strategic alliances provide them with a much more varied supply of products, services and processes than before. The use of uniform and jointly agreed standards as well as of compatible and interoperable systems and IT structures enables the linking and/or exchange of hardware and software via



²⁷ Siri (English abbreviation for: Speech Interpretation and Recognition Interface). See <http://en.wikipedia.org/wiki/Siri>.

²⁸ http://en.wikipedia.org/wiki/Google_Now.

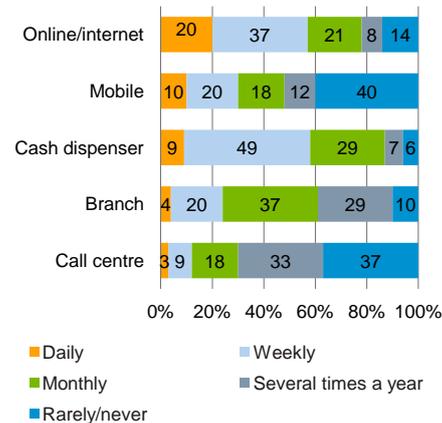


Fintech reloaded – Traditional banks as digital ecosystems

Which channels are used how often?

21

% of customers of international banks
(n=32,642), 2014



Source: E&Y

open interfaces. This spawns new consumer-oriented service packages from various suppliers across a multitude of sectors and markets, up to and including the marketing of the jointly created digital (banking) ecosystem.

The formation of many such strategic alliances is already to be seen in numerous other areas: the potential in the “internet of things” – to give concrete examples, the linking of technologies in the areas of the smart car, smart grid, smart home, smart city and smart “everything” – can only be maximised by applying the logic of breaking down the traditional barriers between sectors.²⁹ The bundling of differing competences as offered by the respective market players thus creates a (digital) ecosystem that can benefit every market participant. The merging of the respective competences, harmonised via open technological interfaces, is actually the key to the success of strategic alliances. After all, valuable competences in the shape of specific experience, skills or abilities are combinable for all market participants in some form or another and in differing intensities:

The competences of traditional banks on the one hand ...

The most valuable comparative advantages that a traditional bank offers include specific financial expertise (risk assessment, evaluation and management), the quality of discretion concerning client-specific (digital) data, as well as many years of experience with high, regulation-induced operating security for clients. Traditional banks have also witnessed countless external shocks and time and again have adapted their structures and processes, i.e. they have valuable expertise with regard to crisis management and know the special features of the financial market.

... and the competences of technology-driven non-banks on the other ...

Not only do the new market players from the world of ecosystems and fintech start-ups speak the language of the internet. They also routinely handle modern web technologies and algorithm-based data analysis instruments. At the traditional banks, especially the fields of recommendation algorithms and evaluation of client data are still in their infancy. Here, however, is a lot of potential for experimenting to gain unforeseen new insights from existing client data. In principle, it is a matter of offering clients modern services via digital channels that generate added value and deliver greater efficiency, declining search costs and easy access to information. Such services are already being offered successfully by various fintechs and internet giants and are equally being lapped up by consumers. However, smallish technology providers often have a too limited reach and too one-sided a product portfolio to be able to survive in the market alone in the long run.

... can provide personalised full range of products and services in an alliance

The flexible corporate architecture of a digital banking ecosystem enables all competences that are available on the financial market to be unified under one umbrella. Modern data and algorithm-based financial services and products are thus offered to consumers (according to the needs of the internet-savvy customer) from a single source. The diverse products and services from differing market players are digitally interlinked and offer customers maximum flexibility in the design of their financial needs. Consumers no longer need to leave the platform and obtain various applications and financial content in the

²⁹ See e.g. <http://www.spiegel.de/wirtschaft/unternehmen/google-kauft-nest-labs-fuer-3-2-milliarden-dollar-a-943362.html>.



Fintech reloaded – Traditional banks as digital ecosystems

form of apps or web-based services that are individually tailored to their respective hardware and software environments. Moreover, the platform architecture helps to transcend conventional hierarchical borders and decades of rather suboptimal silo principles of traditional banks and to strike out on new paths interlinking communication, software and hardware solutions. The new banking ecosystem thus culminates in a platform with an open interface structure offering proprietary and third-party financial services, systems and products. The diverse financial services can be easily and safely procured via an openly accessible banking app store.

4.2 This is what platform-based, modern banking looks like

Modern online banking is very much more personalised, simple, intuitive and convenient for the customer. Customers are at the heart of the digital banking ecosystem with their secure online accounts.³⁰ Within the digital customer account, a large variety of services can be called up both from the customer's own bank as well as from external providers who have linked up to the banking

Modern, platform-based online banking

22



Graph: Oliver Ullmann, Deutsche Bank Research
Source: Dapp, T. (2015). Fintech reloaded – Traditional banks as digital ecosystems. Deutsche Bank Research. Frankfurt am Main.

³⁰ In future, modern banking will not only play a crucial role for private customers (retail banking), but also for other business areas such as corporate business clients. The digital account for business clients also offers considerable potential for digital banking using smart data and algorithm-based financial services.

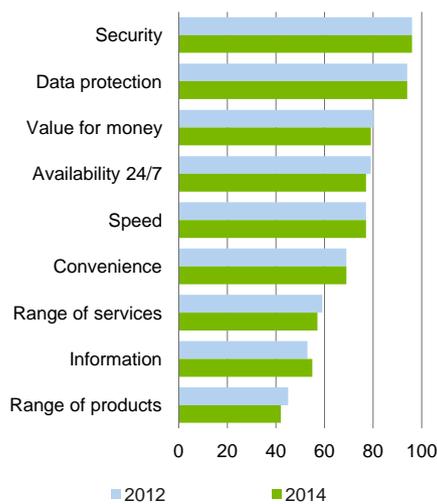


Fintech reloaded – Traditional banks as digital ecosystems

Financial services offered via banking app store

Online banking requirements 23

% of respondents (2012: n=1,002; 2014: n=1,001)

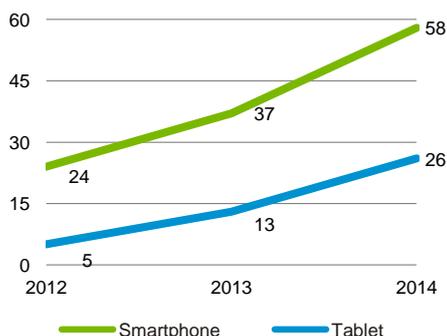


Sources: Initiative D21, TNS Infratest

Voice-activated financial assistant

Ownership of mobile devices in Germany 24

% of respondents (2014: n=1,009; 2012/13: n=1,005)



Source: Initiative D21

ecosystem via open interfaces. Access to the diverse internal and external financial products and services is via the banking app store. In the background, the banks are linked with one another and various external financial service providers such as fintechs, insurance companies and retailers at the technology level via programming interfaces and at the business level via contracts.

With the help of the banking app store customers can independently, quickly and conveniently decide which products and services they would like to access. The different banking apps or web-based financial services can be offered for a fee or free of charge. The diverse applications, products and services show ratings and recommendations that are meant to make it easier for customers to decide. In-house recommendation algorithms are used for this purpose. Interactivity plays just as much of a role as the feeling that one is permanently in a secure IT environment and able to communicate and act without being under observation.

Essentially, customers desire a discreet but individually configurable and intelligent (i.e. self-learning) financial assistant in the shape of an app or else web-based access to their own bank, and would also enjoy a voice activation feature. The idea of the assistant is to support customers in all their daily financial business with data and algorithm-based services. It fulfils the formula for need satisfaction introduced at the beginning of this report. In future it will no longer make any difference whether services are accessed via fixed-line or mobile internet on a given type of device (tablet, smartphone, wearable etc.). There has to be guaranteed problem-free access to their bank and/or online banking on all channels. Comparable to social network platforms, modern online banking will offer a service enabling customers to individualise and creatively design their interface. In the process they can put freely selected and often accessed services in the foreground, i.e. in the personal and secure area. Via mouse click, touch or voice activation, customers also have the option to communicate in confidence and securely with their advisor or arrange for a face-to-face meeting when needed. Another conceivable option is an interface between a customer's online account and the digital calendar of the bank employee so that customers can interactively enter a preferred appointment time.

As a standard service, modern online banking will offer customers an automated (self-learning) record of their income and expenditures which can be presented in chart form or categorised – via mouse click/touch/voice activation – by type or size of expenditure or by date, for instance. On this basis it will then also be possible to interactively calculate customers' differing financial needs in the shape of scenarios. The bank offers proposed are based on the collected and evaluated behavioural data in respect of customer spending patterns or propensity to save or take risks. For example, it is possible to provide calculations showing customers a chart of a consumer loan, property mortgage or retirement plan in line with their financial behaviour. Consideration will also be given to external dynamics (interest rates, securities quotations and exchange rates) which can be changed interactively in the scenarios and forecasts. Additionally, customers can configure individualised services, such as alarm signals or text messages, to inform them of overdrafts or unusual account activity which the underlying self-learning algorithm recognises.

Managing a credit card or bank card (application, cancellation, change of limit, notification of loss/theft) has to be every bit as easy as transferring very small amounts to friends and acquaintances via the contact and address list on mobile devices or wearables. Various external micro-payment firms offer such services. The banking app store makes available not only in-house products, but also external offers. In future, transfers offered virtually in real time could become an attractive bank service. For customers, anonymity on digital channels will (again) play a greater role, since it emerged in the Snowden affair that we all



Fintech reloaded – Traditional banks as digital ecosystems

Seamless configurations across all distribution channels

have a digital twin on the internet. Therefore, a modern payment service could prove attractive and lucrative if it enables customers to pay digitally, either at the bricks-and-mortar point of sale (PoS) or on the internet, and nonetheless remain anonymous.

If customers are on a secure online banking platform and want to configure products and financial services online, a bank advisor should be able to seamlessly continue developing this configuration on other channels without having to reboot systems or re-enter master data. Customers of a modern digital bank should no longer notice that they used different channels up to the signing of a contract or the conclusion of a sale. Ideally, customers should not have to leave the banking ecosystem during online banking visits and the individual transaction steps between the initiation, consultation, configuration and signing of a financial transaction.

Biometrics becoming a firm component of modern banking

For contract signing, in particular, there should also be offers of exclusively online solutions going forward. As regards authentication on the internet, in future biometric recognition procedures, such as fingerprint, hand vein scans, speech, touch and gait identification procedures will become established and supplement – if not replace – current identification procedures that are based exclusively on knowledge and possession. Biometric recognition procedures will increasingly become established in the mass market and heighten the security of current identification procedures on digital distribution channels in particular. Traditional banks should therefore consider stepping up the use of biometric recognition software in their respective business models.

Apple has “Siri”, Google has “Google Now”, banks have “Money Penny”

“Hello, Money Penny. How has the DAX been doing?”

A further way for the banking ecosystem to advance the interaction of artificial intelligence and humans is to offer customers a proprietary biometric speech recognition service and/or a personal financial assistant along the lines of Apple’s “Siri”. The speech recognition service offered in modern online banking could be called “Money Penny”. Via their voice-activated mobile devices customers could thus receive personalised advice and support for their everyday financial affairs. “Money Penny” could conveniently handle simple inquiries about securities prices or performance. Over time, and thanks to the underlying self-learning algorithm, “Money Penny” could broaden its knowledge base, i.e. become more intelligent, and answer more complex questions. Of course, it would be absolutely mandatory to comply with existing data protection rules and engage in transparent communication with the customer on possible use of the personal speech data.

Deploy proprietary recommendation algorithms

When a financial service is being contracted, recommendations of peers, that is of comparable customers with similar patterns of consumption, payment, savings/investment and risk aversion etc., are displayed for comparison. The additionally gained valuable behavioural patterns of the customer provide the basis for new, personalised sales approaches going forward. For example, attention may be drawn to a potential reduction of a customer’s fixed costs or to alternative savings potential. The following communication with customers could take place in the secure area of their online account:

Recommendations Amazon style

“Hi, Tom! 47% of your peers have also bought this product (e.g. a mutual fund) and achieved an average return of 13.8% p.a. Furthermore, 36% of our customers that acquired this product also opted to complement it with products X (mutual fund savings plan) and Y (equity-based savings) in their secure online account or watched an analysis of these products in an animated film. An

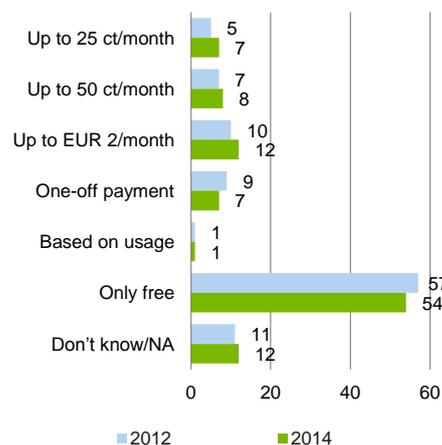


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We live in a data industry

Willingness to pay for secure transactions in online banking 25

% of respondents (2012: n=1,002; 2014: n=1,001)



Sources: Initiative D21, TNS Infratest

investment advisor is standing by and could assist you on various channels. Also, we would like to inform you that you pay 7.89% more for your liability insurance and 23.4% more for your car insurance than your peers. Let us show you alternative, cheaper offers, also from external providers."

In our data economy, each new piece of customer information and each behavioural pattern measured now delivers a new way of making contact with the customer and offering appropriate, personalised products and services. These new services along a bank's value chain should enable customers to make better investment decisions and derive greater benefit from the services of their house bank.

A large share of customers will probably be unwilling to pay a fee for "basic services". In a recent survey, more than half the respondents objected to an additional transaction fee – for example in online-banking (chart 25). This probably also applies to further simple external financial services. However, additional services building on the existing basic services could indeed have a price tag, as long as they generate additional value for the customer. The customer should be able to choose between a free basic service and an extended, exclusive premium service. So if up to now the account transaction record has been made available free of charge for a certain period of time, this period could easily be doubled via modern data analysis for a fee. A further valuable service is individual storage space in the bank's own data vault (cloud service). Consumers would have the option of conveniently storing all their digital messages, account statements, credit card invoices and general financial correspondence (invoices, tax returns etc.) up to a sufficiently large capacity limit without any time constraints within the secure bank IT environment, and they could call them up at any time around the clock. More storage capacity or possibly additional services could be offered here for a fee.

From inside their online account consumers can also branch out to products and services offered by third parties. For example, some fintechs operating in the mobile payments space offer mobile payment solutions that enable the consumer to transfer payments from A to B via email or text message (messenger service). These services are performed conveniently and virtually in real time via the contact list on mobile devices (smartphone, tablet, wearables), while the secure infrastructure of the digital banking platform works in the background.³¹ Moreover, it is also possible to offer simple and completely digital investment products from third parties if they have entered strategic alliances with the banking ecosystem.³²

Regional, locally linked networks increase customer utility

Diverse array of network platforms offered in the banking ecosystem

Contingent on customer consent and consideration of the regulatory framework (e.g. banking secrecy) differing networks with local links may also arise or be actively offered within the customer's own bank. For example, diverse networks with local and regional tradespeople or doctors could be formed that offer bank customers their products and services via the banking ecosystem. The payment transaction between tradespeople/doctors and customers would moreover be seamless and easy to fulfil since both parties are customers of the same bank and theoretically only one internal bank posting is involved. A further appealing network could have the character of a crowdfunding platform. Some projects can be implemented despite being rejected by committees of funding establishments or traditional financial institutions because the "crowd" considers the project to be worth supporting and provides funding. Crowdfunding can thus

³¹ See offers from e.g. <http://newsroom.fb.com/news/2015/03/send-money-to-friends-in-messenger/>; <https://www.cringles.net/> or <https://www.lendstar.io/#home>.

³² See offers from e.g. <https://www.vaamo.de/> or <https://www.weltsparen.de>.



Fintech reloaded – Traditional banks as digital ecosystems

Establishment of a digital mobile payment system

be used as a community funding instrument to promote regional projects, for instance, that would fail due to lack of support from traditional funding instruments.³³ Creditors and debtors would be customers of the same banking ecosystem, who organise themselves on a bank-owned platform. The bank merely provides the infrastructure and is not liable for potential risks because the lending of the crowd capital is not handled by the bank, but instead by the customers (peer to peer).

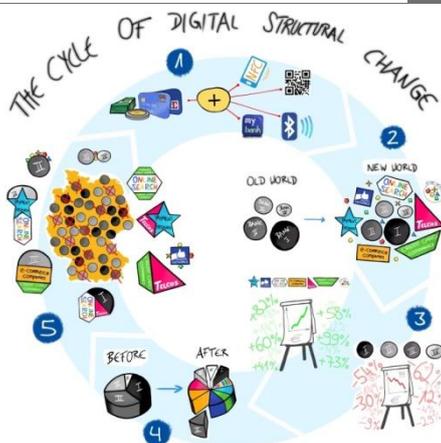
As mentioned, using uniform standards and open programming interfaces, a bank's own mobile payment service could also become the established system by linking in other banks, retailers and miscellaneous market players. Diverse retailers could set up connections with the banking ecosystem to offer bank clients special customer loyalty programmes.

Potential for open innovation and crowdsourcing

Regular consideration of external feedback is appropriate as a form of internal quality management. Integrating external knowledge owners and customers interactively into complex innovation processes can have a positive impact on company innovation rates. So to find out which preferences and desires customers express with regard to their online accounts or what changes they would suggest, one possible approach could be to hold idea competitions on a regular basis. To obtain further suggestions it is no doubt also worthwhile for the management to seek regular internal communication with the related call centre for complaint management in order to subject the services offered to a permanent quality audit.³⁴ The data evaluated by the "Moneypenny" software will certainly also reveal information about new, previously unimaginable financial services.

5. Conclusion

The cycle of digital structural change 26



Digital change is finding its way into all aspects of our lives and leading to fundamental upheavals. The digital economy has further-reaching complex and reciprocal effects than many people (initially) assumed. The music and publishing industries have felt the painful impact of the digital onslaught for over 20 years. Initially they adapted their business models slowly and hesitantly, but lately very successfully to the challenges of digital change. Consequently, the change is not a self-contained process, but instead an ongoing cycle which is steadily being driven by the emergence of new (partly disruptive) technologies.

Over the past few years many traditional banks have also felt the sometimes disruptive forces being unleashed by the internet's conquest. They have recognised the trend and are working feverishly to devise possible strategies. Customers readily accept the digital solutions and these can be experienced at the front-end in particular. But the traditional banks will not score a major success with the fragmented go-it-alone solutions now in evidence. Digital change requires far-reaching structural reforms that extend beyond all business areas.

Use of key technologies

People have underestimated the power of the internet from the outset, and continue to do so. What we have here is not merely the fusion of the online and offline worlds or the digital transformation of certain financial services. We are looking at fundamental changes in conventional banking and a break with the outdated silo mentality in innovation processes. New key technologies need to be deployed across the board. This will require unbiased acceptance of moves to make optimum use of the modern technologies with existing resources as well as the will to adopt new analytical methods and work approaches. This will all be based on a single, digital platform, one that is as open as possible.

³³ Theil, A. (2012). Cofunding zwischen privater und öffentlicher Förderung. In: Das Co-funding Handbuch. 2nd edition May 2012. Published by tyclipso.me in association with Startnext.de.

³⁴ Von Hippel, E. (2005). Democratizing Innovation. Cambridge, MA. MIT Press.



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Technological progress enables the use of modern, cognitive, self-learning algorithms and intelligent financial software which in future will ensure that new services can be generated from (valuable) existing and newly acquired data sets. Of course, this will not make bank consultants redundant. However, one thing is clear: all financial products and services that are easy to standardise and automate will give way to modern technologies in future, that is, the human factor will be displaced in many non-knowledge-intensive financial services and replaced by machines, software and hardware. This will naturally also have implications for bank branch structures. At the same time, new requirements, competences and ideas will ensure that new training programmes and professions become established, too. This is not a revolution that is having an impact on banks out of the blue. This is a logical and evolutionary step being driven by sector-overarching technological advance.

Technologies are merely a means to an end

Of course, technologies must never be merely an end in themselves, but be used instead as a means to an end so that an entity's own business model can be adapted to the digital architecture of the 21st century. Nevertheless, the very issue in tomorrow's – and already today's – noticeably changed competitive environment is the use of new (cognitive) technologies. In the long run, traditional banks will continue to feature advisory-intensive products and services in their various business divisions that cannot simply be replaced by artificial intelligence. Humans, with their emotional and social intelligence, will remain at the heart of advisory business.

Recognise patterns of digital ecosystems, adapt and improve practices

With their digital infrastructure and the harmonious interlinking of implemented hardware and software solutions, digital ecosystems are successful market operators. So there are future opportunities above all for those firms and/or banks that swiftly succeed in embedding their internal and external processes, products and services as flexibly as possible into a digital company infrastructure in order to quickly anticipate new technologies as a platform or engage in timely, uncomplicated strategic alliances with relevant market players. After all, the optimum interlinking and utilisation of compatible and interoperable standards/technologies as well as open interfaces pave the way to a world of attractive products and services for consumers that is simultaneously varied, transparent and convenient as desired. In this context, the key to success is an interface policy with suitable open APIs. This will allow a flexible corporate architecture to be guaranteed in the long run in order to be better able to respond to as yet unimagined technological achievements in future. The development or rewriting of software and/or the programming of an additional open interface will probably remain the key enabling modern technologies to be bolted onto an entity's own value-added structure also in future.

Walled garden strategy a good fit for numerous sectors

Given the current competitive environment, many heterogeneous sectors are being hit by the structural change today. The respective companies and banks are all in the same boat because they all have to face the more or less identical challenges of digital change. It is striking that all the sectors involved and affected are being challenged by the same new technology-driven market players. In a nutshell, it is always the universally familiar major internet platforms with their similar strategies that for years have increasingly and very successfully been expanding in numerous business areas also beyond their core competences. This proves that many established firms in a variety of sectors are being challenged by the similar strategies of digital ecosystems. It follows that many traditional companies also outside the banking sector have the opportunity to respond to the changes in the competitive environment with the same strategies. For, obviously, the platform-based walled garden strategy



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is capable of successfully and sustainably stimulating the needs of consumers from differing industries, sectors and regions.

Traditional banks now have the opportunity to face up to the challenges of digital structural change in what is not only a defensive reaction, but also in such a way that they are also perceived as serious, innovative market players eager to take an active part in the remodelling of financial services. At this juncture, transforming into a banking ecosystem represents an effective strategic option.

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³⁵ Many thanks to Oliver Ullmann for his “handmade” illustrations and to Jan Trenczek for his support in researching the data.



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