
From open banking to embedded finance: The essential factors for a successful digital transformation

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Abstract Consumers' needs have changed significantly in recent years, and so have their expectations of financial services. Not only does a large part of their life take place online, but digital apps and products are also integrated into everyday situations. Instead of offering isolated products on a website, companies therefore began to address consumers right at their 'point of need' — on e-commerce platforms, in apps from mobility service providers or on comparison portals. Banks can adopt this approach by embedding financial services into the products of non-bank companies, thus offering seamless processes and an increased level of convenience to their clients. Open banking is what provides the foundation for this concept of 'embedded finance', by allowing third parties to access banking data via technical interfaces — so-called application programming interfaces (APIs). In 2015, Deutsche Bank decided to take advantage of the opportunities offered by open banking. Through an API programme, the bank enables its partners and customers to integrate banking data as well as financial products and services into their own applications and products. Thus, partners can offer financial services to their customers directly at the point of need. The work of Deutsche Bank's API Program has

provided valuable insights into how banks can successfully open up and even take the next steps towards embedded finance. This paper looks at Deutsche Bank's experience with open banking and the possibilities and opportunities for embedded finance and presents best practice examples for the necessary internal transformation of financial institutions.

KEYWORDS: APIs, open banking, embedded finance, banking-as-a-service, digital transformation

INTRODUCTION

The Payment Services Directive 2 (PSD2, EU) and the Open Banking Standard (UK) have made open banking a much discussed subject in recent years. Regulators required financial institutions to open their systems to the outside world via standardised technical interfaces — application programming interfaces (APIs), as they are called — and to allow third parties to use financial data in areas beyond the actual banking business. This has enabled providers to bring new digital applications to the market and provide their users with individualised services based on banking data for the first time.

But apart from the mandatory implementation, many banks are still reluctant to embrace open banking as an opportunity. It is not only regulation, however, that is forcing banks to rethink how and to what extent they want to offer open services. The COVID-19 pandemic has also shown how important digital processes are and that customers need flexible banking solutions, especially in times of crisis. But also, in general, the needs of consumers have significantly changed in recent years. Today, a large part of their lives is spent online — on e-commerce platforms, in apps of mobility service providers or on comparison portals. Of course, they expect banks to be where they are and to integrate themselves into this digital world.

While open banking enabled third-party providers to access customers' banking data for the first time, customers today want to receive entire financial products and services directly in non-bank offerings wherever

possible. For banks, this poses the challenge of finding partners with whom they can jointly develop suitable products and who want to integrate financial services into their own offerings. The goal is to offer customers a seamless experience so that they can use financial services in a specific context without having to switch between different applications. This could be, for example, a consumer loan or a 'buy now, pay later' service that is integrated into the payment process of an e-commerce app and offered to the customer directly at the point of need.

To make this possible, the bank's corresponding processes must be digitalised end-to-end and accessible from the outside via digital interfaces. Partners can then use the bank's products and services like a collection of Lego bricks and assemble them into new product offerings suitable for their target group.

THE ESSENTIAL FACTORS OF SUCCESSFUL OPEN BANKING

In order to fully exploit the potential of open banking-based business models, banks need to build their own ecosystem with partners and end users in which all participants benefit from each other. This requires a profound transformation of the bank's own organisation towards a business model focused on openness.

Open banking is a very powerful combination of building the technology that enables data access, creating an inspiring developer and partner experience as well as ultimately delivering a seamless and

smooth experience for the customer. When the Deutsche Bank's API Program was established, four essential success factors of open banking emerged, all of which are equally important. Only by taking them all into account can 'real' open banking develop beyond regulation.

Essential success factor #1: Premium APIs — the technical foundation of open banking

Technology is the main ingredient of open banking. APIs offer partners a convenient way to access banking data and services — naturally with the data owner's prior consent. Through these easy-to-integrate interfaces, systems from different companies can communicate with one another in a secure, controlled and, above all, automated manner.

API-based business models offer extensive potential for innovation and growth, as has been observed for years in other industries. The 'Open Banking Monitor' of consultancy firm Innopay,¹ however, demonstrates that

financial institutions are still hesitant: APIs of many banks offer only the scope of services required by PSD2. This includes the initiation of transfers and access to the current account transactions of the last 90 days.

But there are exceptions. More and more banks are offering 'premium' APIs. These enable, for example, a more comprehensive transaction history or access to 'know your customer' (KYC) data in order to reliably check the age, address and identity of the account holder. Interfaces for accessing credit card and securities account data as well as innovative payment APIs are also possible. In theory, there is no limit to the data and services that could potentially be offered. It is important, however, to tailor the API products in such a way that they are reusable and attractive to a whole range of third-party providers, from FinTechs to corporate customers to online retailers (Figure 1).

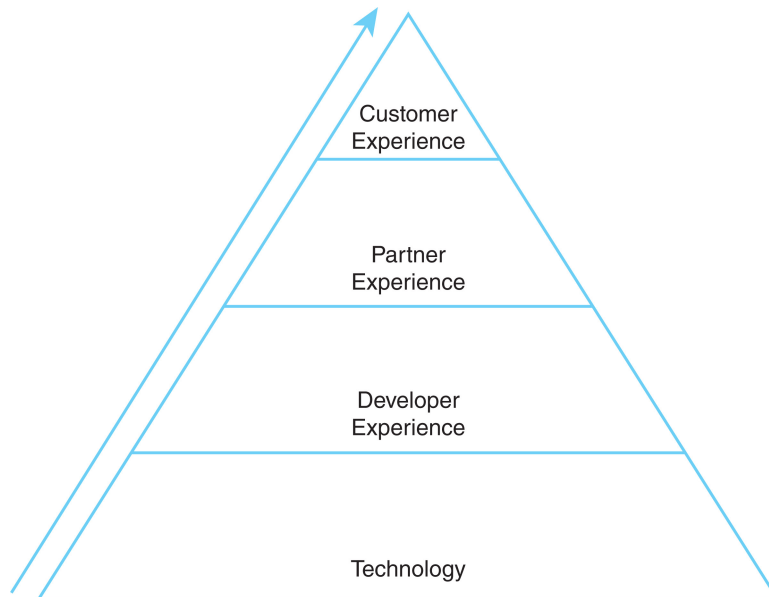


Figure 1: Technology is the foundation for the further pillars of successful open banking

Source: Deutsche Bank.

Essential success factor #2: Developer experience

In addition to the functional scope of the APIs, the developer experience is another important component of successful open banking. For external developers to be able to find, understand and use the APIs quickly and easily, banks have to offer extensive developer portals. Banks should therefore be asking themselves, are the range of functions and the practical use of the APIs clearly and comprehensibly documented? Can external developers register within a few seconds? Is it possible to test application ideas in a sandbox?

The social dimension is just as important as the functions of the developer portal. How quickly does the support react to technical questions? Is the bank investing in building a developer community, for example, in the form of developer events, forums, blogs and newsletters? To what extent does the bank support dialogue and networking between external developers? Do support inquiries end up in an anonymous ticket system, or is there a personal contact person and dialogue at eye level?

All of these points offer banks the opportunity to set themselves apart. Financial institutions, however, will find it difficult to provide an excellent developer experience if they outsource the associated technologies, tasks and support processes and use ‘out of the box’ developer portals.

Essential success factor #3: Partner experience

Experience shows that the principles of the ‘long tail’ business model are best suited for open banking, in which selling a large number of niche products leads to a high sales volume. The majority of data products also serve niche markets, which can be highly profitable, but also require very specific knowledge owing to the target group and their requirements. This is where an essential element of open banking comes into play — working with partners who

have greater expertise in the respective niche market than the bank itself. Thanks to the API offer on the developer portal, they can develop these niche products largely without using their internal resources.

That is why banks need to ask themselves, how can we connect with this huge ecosystem of ideas, and how do we enable others to innovate with us and for our clients? Banks should involve partners at a very early stage of the development phase in order to understand their needs and pain points and to learn how banking data can help accelerate and grow their business. This is the only way banks can ensure that they solve real business problems and deliver value from day one.

The first contact between the bank and potential partners usually takes place on a business and not on a technical level. The API offerings of Big Techs are a good example of non-technical and understandable descriptions of how individual APIs solve industry-specific challenges. On its developer portal, Google offers several business landing pages, for example, on the subject of ride sharing,² as well as compact case studies just for its Google Maps API. Special event and content formats can also help to make the topic of open banking and APIs tangible for decision makers from the business areas.

Partnerships with banks can take very different forms — depending on the needs of the third-party provider. And, surprisingly, the most exciting partners for Deutsche Bank were often those companies for whom the API offerings did not seem to be suitable at first glance. In discussions with these companies, innovative ideas for new offers and products often emerge.

But what all partnerships have in common is that they should be able to start as quickly as possible. In the early days of Deutsche Bank’s API Program, partner onboarding took several months, which was unacceptably long for companies from the start-up sector. This process has been significantly accelerated

through close cooperation with Deutsche Bank's first API partner 'dwins'. Today, new users of the API can access test data from the bank within minutes and, thanks to a standardised process, get access to real customer data within just 2 weeks (Figure 2).

Essential success factor #4: Customer experience

The fourth success factor revolves around the actual customer experience. Customers do not 'demand' open banking. They just want banking to be seamless, secure, real-time, transparent and integrated into easy products that help them solve a problem or manage their lives. Especially in the debate around PSD2, open banking has been strongly reduced to technical or regulatory aspects. But at the end of the day, open banking always requires a person — a private or business client — to agree to link their bank account with the app of a third-party provider. Banks' communicative activities should therefore focus less on the technical details but more on concrete advantages. This could be, for example, the automation of business processes, the acquisition of new customers or the development of new sources of revenue through the API-based, digital distribution of banking products.

Nonetheless, there are other factors that determine whether customers will accept open banking offers. For example, they rightly expect reliability when it comes to data protection. Open banking often contains sensitive information, and the success of the use case depends heavily on the trust that bank customers place in the partners' offers. In the recent past, data security concerns have often been trivialised with slogans like 'convenience beats trust'. It is true that social media such as Facebook or Instagram have led to a rather loose handling of data. But it would be wrong to transfer this development to the handling of financial data. They are still considered by far the most worthy of protection among consumers. After all, nobody wants to put their assets or personal data at risk unnecessarily.

That is why financial institutions must focus on data economy and transparency. For example, Deutsche Bank does not pass on any customer data. This data always belongs to the customers, and only they can authorise the bank to grant a partner access to selected data — an order that has to be issued separately for each individual application and is the prerequisite for the full functionality of the digital offer.

In many cases, third-party providers rely on banks to actively advocate them and

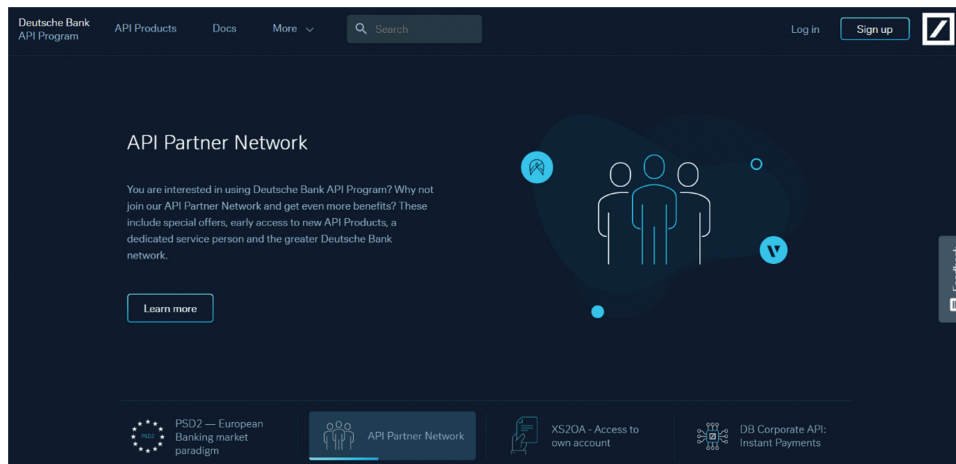


Figure 2: Special community offers are an important building block for banks to be attractive for partners
Source: Deutsche Bank.

label them as trustworthy partners. What at first seems like a burden with no benefit can, under certain conditions, turn into a competitive advantage. Through the targeted curation of individual third-party providers, banks can position themselves as a platform that offers their customers exclusive access to the products and services of hand-picked, trustworthy partners.

OPENING UP IS A MARATHON, NOT A SPRINT: THE INTERNAL TRANSFORMATION OF BANKS

Deutsche Bank’s API Program began in 2015 as an initiative of three employees from the bank’s technology department. In the process of exploring future scenarios and innovation strategies, the idea of a technical opening of the bank also emerged. Initial research made it clear that the great success of digital platforms was, on the one hand, closely linked to the systematic use of APIs but, on the other hand, also required a completely new self-conception of the bank.

It quickly became apparent that the development and implementation of API-based business models is not a purely technological undertaking. This was reflected in the composition of Deutsche Bank’s API team, which grew to over 30 employees within a short time. The classic separation of IT and business was no longer adequate. In addition to project managers, programmers and scrum masters, the team also consisted of specialists for API product development

and marketing as well as API partner managers, community managers and support professionals.

These roles often require a high degree of generalisation, as the team acts like a start-up within the organisation. Deutsche Bank does not consider digital interfaces merely as part of the IT infrastructure, but as products. API product managers, for example, are responsible for conceptualising, designing and bundling new data products. This requires creativity as well as professional project management. They need to know and understand the terminology, jargon and industries of potential users, while translating their needs into concrete requirements for developers. At the same time, they must have an entrepreneurial mindset, and, in order to market the API products successfully, work closely with the team’s marketing and partner specialists (Figure 3).

Establishing digital interfaces in a financial institution involves a lot of education and communication — both internally and externally. And that is not all: open banking requires new skills, new technologies, new cross-functional forms of collaboration and a new mindset. All in all, open banking means an enormous cultural change for traditional banks. They must transform closed structures into open architectures, view competitors as potential partners and rethink the role of their IT department, which, for the first time, is not only an internal service provider but also becomes an enabler for a new business model.

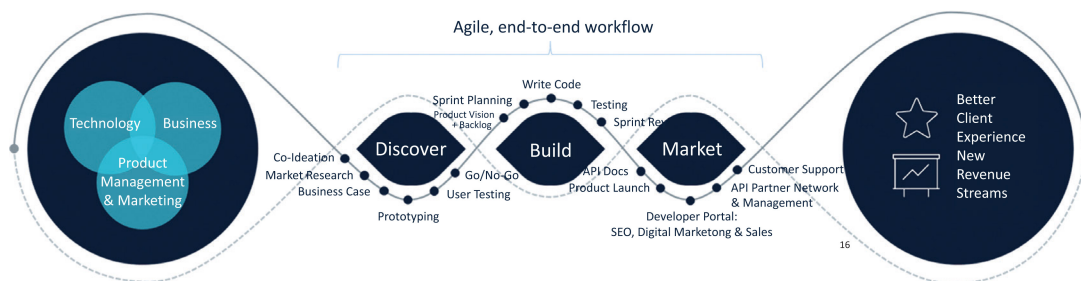


Figure 3: The API life cycle process from development to marketing
Source: Deutsche Bank.

The path to open banking is complex and surely not straight. In order to master the organisational and technical challenges, the support of internal stakeholders and the mobilisation of resources are essential. Once the foundation is in place, the next step is to tackle tasks like building a dedicated community of partners and developers to scale the API programme. This can succeed only if the relevant technology, teams and processes are built up internally and are systematically anchored. And while this may cost time, money and energy, it offers the unique opportunity to gain valuable experience and establish important core competencies and knowledge within the company.

Learn to walk before you can run

A lot of convincing was needed, especially in the initial phase, to establish the Deutsche Bank's API Program and to open the bank to new partnerships and business models. Similar to building a start-up, it was important to gain internal sponsors for the project in order to obtain the necessary funding. Therefore, the focus should be less on the technical details and more on the customer benefits and the strategic potential of the project. From the perspective of internal decision makers, however, potentials initially represent unfulfilled bets on future developments.

In order to counter their scepticism and not delay decisions due to uncertainties, the API Program worked closely with external experts who specialise in platform-based business models at an early stage. A good example is the cooperation between Deutsche Bank and the Massachusetts Institute of Technology (MIT): thought leaders in the platform economy such as Geoffrey Parker, the author of the book *Platform Revolution*,³ supported Deutsche Bank in transferring knowledge and building trust, for example, in internal workshops and events for bank executives, or as speakers at external events or joint media appearances.

But even the most sophisticated presentations offer only a limited opportunity to make the abstract topic of API-based business models really understandable. With this in mind, Deutsche Bank found a way to make the topic more tangible: in 2016 the team organised an external hackathon.⁴ There, external developers from FinTechs and start-ups were able to use the new interfaces of Deutsche Bank for the first time based on their own specific application ideas. One of the jurors was Christian Sewing,⁵ current CEO of Deutsche Bank, who was won over as a speaker for the event in his previous role as head of the bank's business with private and corporate clients.

The three-day 'API/Open' competition attracted 750 applicants and 70 participants from 22 countries. The user feedback gained was an important step towards market maturity. The event also led to a collaboration with the winning team 'dwins' and the development of the app 'Finanzguru'.⁶ This first use case showed the market potential of digital interfaces and was an important starting point for Deutsche Bank's further open banking journey.

Apart from these facts and figures, the hackathon also showed the bank's internal decision makers on an emotional and social level what topics like 'openness', 'API-based business models' or 'digital ecosystem' really mean. An abstract and often purely technical idea had suddenly turned into an experience full of personal encounters and stimulating discussions (Figure 4).

API FIRST – THE BASIS FOR SEAMLESS DIGITALISATION AND A TASK FOR THE WHOLE ORGANISATION

Essential to scaling up is gaining a broad understanding and support within the organisation. While an API programme can be a good starting point and the developer portal provides the structure and framework for scaling, it is ultimately important to



Figure 4: The winning teams of the Deutsche Bank Hackathon 'API/Open'
Source: Deutsche Bank.

mobilise the organisation itself. An 'API first' strategy is the essential basis for developing more and more data products with the necessary priority.

Whenever a new digital banking product is developed, be it an account opening or a credit application line, either existing APIs and components should be used or the necessary interfaces should be developed at the same time. This approach also offers decisive advantages within the bank. Every financial product for which interfaces are available significantly reduces further development times and costs.

By reusing existing components, banks can increase their speed of innovation and introduce new products to the market much faster. For example, instead of building a consumer credit line that can be used only by a single business unit and for a specific partner, all parties involved should develop their technical services in a scalable way from the outset. The associated credit rating service or the document application line could, for instance, later be used for other products and in other contexts.

While 'API first' may seem very technical at first, there is always a comprehensive non-technical transformation behind it

that must take place across all areas of the bank. In addition to technical basics such as APIs or the design of reusable services, internal education and motivating the various product areas play a major role. For embedded finance products to become interesting for partners, the bank product itself must also be considered as a building block. This sometimes raises fundamental questions, such as how individually the conditions for partners should be designed or how and whether the bank's brand should appear.

Open banking means looking at the entire cycle: starting with the wishes of the potential partner, through the technological implementation to the design of the product and delivery. This process is not a one-way street and not a one-off project — those involved must constantly process new experiences from practice and incorporate them into the further development of the overall product. Central to this is the role of the product managers. They must cover the entire process in their thinking, take up innovative ideas from the market and drive the development both technically and professionally. Their position thus combines an IT and a technical role — a novelty in

banks and yet elementary for digital product development. Technology companies have already been demonstrating how well this works for several years.

The more precisely the building blocks are cut, the leaner the processes for integrating the partners will be; and the closer the product managers of the bank and partner companies work together, the greater the success of open banking will become.

Ultimately, however, it is also crucial for successful scaling and growth to continually expand the tools and services for partners. This includes a dedicated community management for developers as well as tools that enable rapid data integration and automated onboarding on the developer portal. The better and more automated these services are, the 'longer' the 'long tail' model can become without undermining profitability.

API programmes therefore play a central role in initiating a 'flywheel of open banking'. In the course of time, they will switch from a producing to an orchestrating and advisory role. And the more self-sustaining the subject becomes in the organisation, the faster a new era of open banking will be ushered in.

OUTLOOK: EMBEDDED FINANCE — A TREND, A CONCEPT AND A TRIPLE WIN SCENARIO

The implementation of open banking lays an important foundation for the very promising trend of 'embedded finance' — a business model that emerges for all those banks that master the shift towards premium APIs, developer, partner and customer experience as well as transformation within their organisation.

There are a number of positive signals that show why the transformation towards an 'open' bank will pay off. Today, for example, numerous online shops already integrate various payment functions, thus significantly streamlining their checkout process and

reducing shopping cart abandonment rates. This matches a study by PPRO, which shows that 44 per cent of UK consumers would abandon a purchase if their preferred payment method was not offered.⁷

By taking financial services directly to the point of need, embedded finance picks up precisely on the changing demands of customers. It is not without reason that platform strategy experts such as Simon Torrance forecast a total market demand for embedded finance of more than seven trillion dollars in 2030.⁸ For European banks, this is another reason to overcome their hesitation to enter into partnerships and give external companies access to their customers' data. Because one thing is already foreseeable today: in the future, customers will increasingly use those offers that provide them with a high-quality and individualised consumer experience — including convenient payment and financing options.

One thing banks can learn from tech giants like Google or Amazon is how important it is to really understand their customers and to position themselves as a regular part of their everyday lives. By providing interfaces such as the Google Maps API or Alexa Voice Service APIs, these companies create a very high level of convenience so that people feel it would reduce their quality of life if they had to do without the services they are offered. For many users of ride services such as Uber or Free Now, it is now a matter of course to pay by smartphone app rather than cash at the end of their journey. In addition, Google has started offering the 'Pay for parking' function⁹ at selected locations, with which drivers can search for their parking spaces in the Google Maps app and pay for them on the spot.

But embedded finance is not limited to payment transactions alone. Loans, insurance or investments can also be integrated via technical interfaces. For those who are short of cash at the end of the month, 'buy now, pay later' offers a much-used option to pay in

instalments. In the US alone, Adobe analytics data¹⁰ shows a 215 per cent year-on-year increase in this payment method in January and February 2021. Alternatively, customers can divide the final amount into several instalments at the click of a button. Provisions for the future can be made with savings programmes that automatically round up their purchase amounts and invest the small change in shares, for example. Embedded finance thus makes banking products an invisible yet ubiquitous part of daily life.

THE BENEFITS OF EMBEDDED FINANCE

As with open banking before, all parties benefit from embedded finance. By cooperating with non-financial companies, banks create new sales channels. Through these, they can tap into new target groups and address potential customers exactly where they are. Their partner companies, which embed financial products and services in their own offerings, increase market relevance and can completely align their value chain with the needs of the consumer.

At the same time, online retailers, for example, maintain direct contact with their customers across all stages of the customer journey. They no longer have only the user data collected by themselves but can supplement this with transaction data and thus the payment behaviour of their customers. This forms a clear picture that allows them to fully place their offers in the context of consumers' lives.

In the end, the customer also wins: the quality of the offers is perfectly tailored to them, in terms of both time and content. They can buy the right financial product directly at the point of sale, that is, when they need it, and do not have to switch back and forth between different applications to do so.

CONCLUSION

Open banking is a learning process, and nobody should be afraid of failure. The

opportunities that arise from opening up are priceless. The transformation of the organisation pays off in different directions: it increases the speed of internal delivery through end-to-end digitised processes. It equips the organisation with a new role model and a new way of working. And it helps to retain and win customers through innovative new products and solutions.

Open banking can potentially enable a multitude of new business opportunities, and financial institutions will need to keep evolving. Embedded finance is a promising approach, but it will not remain the only one. In the future, it will be important for banks to grow beyond their traditional role and to think not only in financial scenarios but also in cross-sector partnerships and contextual situations.

Banks can even be role models and lead the opening process of other industries, from energy to mobility. This is an opportunity they should seize because the more industries open to the outside world via APIs, the faster we will reach the next evolutionary stage: an open data economy.

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