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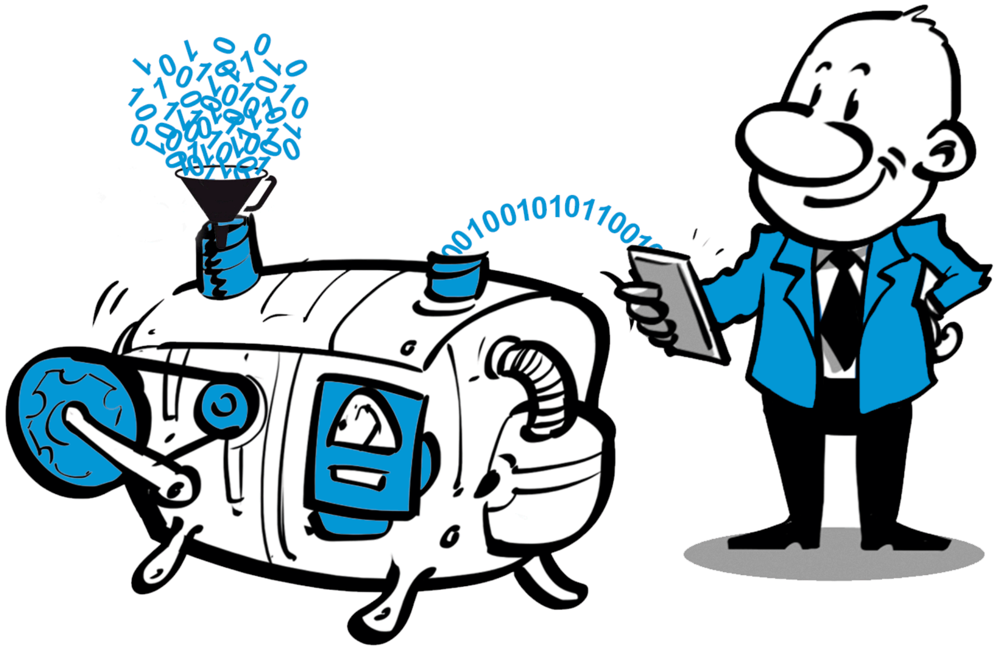

Data Exploration Opportunities in Corporate Banking

Key concepts and applications

Open Banking Working Group

September 2017

CONTENTS

This information paper is the result of an analysis carried out by the Open Banking Working Group and Innopay.

FIGURES AND PICTURES

TABLES

1. EXECUTIVE SUMMARY

Digitisation within and between organisations is advancing at an ever-increasing pace, leading to a growing interest in data-driven value creation. Corporate banking executives may have to (re-)define their operating model, develop (technology and people) capabilities and define relevant value propositions to be able to compete and collaborate in the digital era.

Various data streams of corporate[1] businesses exist today in multiple internal software systems, varying from relatively simple accounting software solutions to advanced Enterprise Resource Planning (ERP) and treasury management systems. The data streams in these systems are increasingly interlinked as organisations work together and exchange transactional messages along the corporate value chain (see Figure 1).

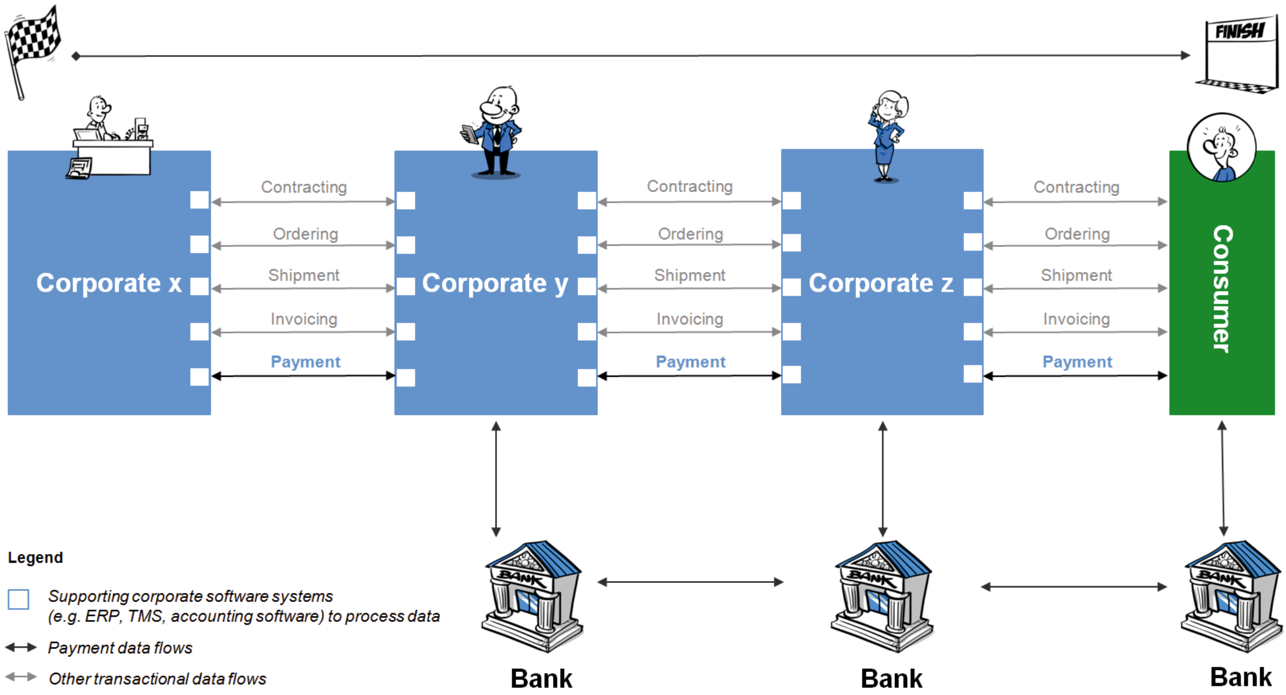

Figure 1: *Transactions (payment and non-payment) within and between corporates in the value chain*

Value creation based on data has mainly revolved around leveraging purchase and payment transaction data, offering ample insights for improved customer service, better fraud and risk management, and targeted commercial opportunities. The financing business typically encompasses ERP data from several transaction types (such as orders, invoices and shipment bills) and related processes. These processes typically involve manual (and sometimes paper-based) handling.

Data exploration opportunities in corporate banking can be visualised as a hierarchy of data **a**vailability, **a**ccessibility and **a**nalytics, as depicted in Figure 2. We refer to this hierarchy as the '**Triple A**' model. In the digital realm, data is increasing in volume (i.e. collection of vast amounts of data) as well as in variety (i.e. internal and external data sources) and velocity (i.e. flow of data). Increased availability of (hitherto un-/underutilised) data and the accessibility of this data through new connectivity options (e.g. Applica-

[1] When we refer to 'corporates' throughout this report we refer to businesses with more than 250 employees and turnover of 50 MM EUR. 'SMEs' (Small and Medium-Sized Enterprises) are businesses with employees or turnover below said thresholds. Where relevant, we refer to "long-tail" SMEs to indicate the self-employed or micro enterprises.

tion Programming Interfaces (APIs)), regulatory developments (e.g. revised Payment Services Directive (PSD2) and General Data Protection Regulation (GDPR)) and Open Banking lay a sound foundation for value creation from data analytics in corporate banking.

In the analytics domain at the top layer, data is converted into actionable information, both from hindsight and foresight perspectives, delivering insights for informed management decision making with the aim to create value.[2] Value creation from data analytics in the corporate banking domain is mainly *internally* oriented and includes application areas such as improved product development, targeted market/sales efforts, operational efficiencies and better risk and fraud management. Analytics provide a good source of creating potentially priceable service components.

While banks have access to their own internal data, this is mostly not sufficiently unique to allow unlocking specific, actionable insights critical to maximise the value of data analytics and differentiate their value proposition towards corporates.

Many Fintech initiatives, in contrast, have emerged developing innovative, value generating services based on corporate banking data, provided under the corporate's mandate. Fintech and bank partnership models could create win-win relationships, differentiated value propositions and generate returns commensurate with investments by collecting vast amounts of data and enabling secure and seamless accessibility to this data.

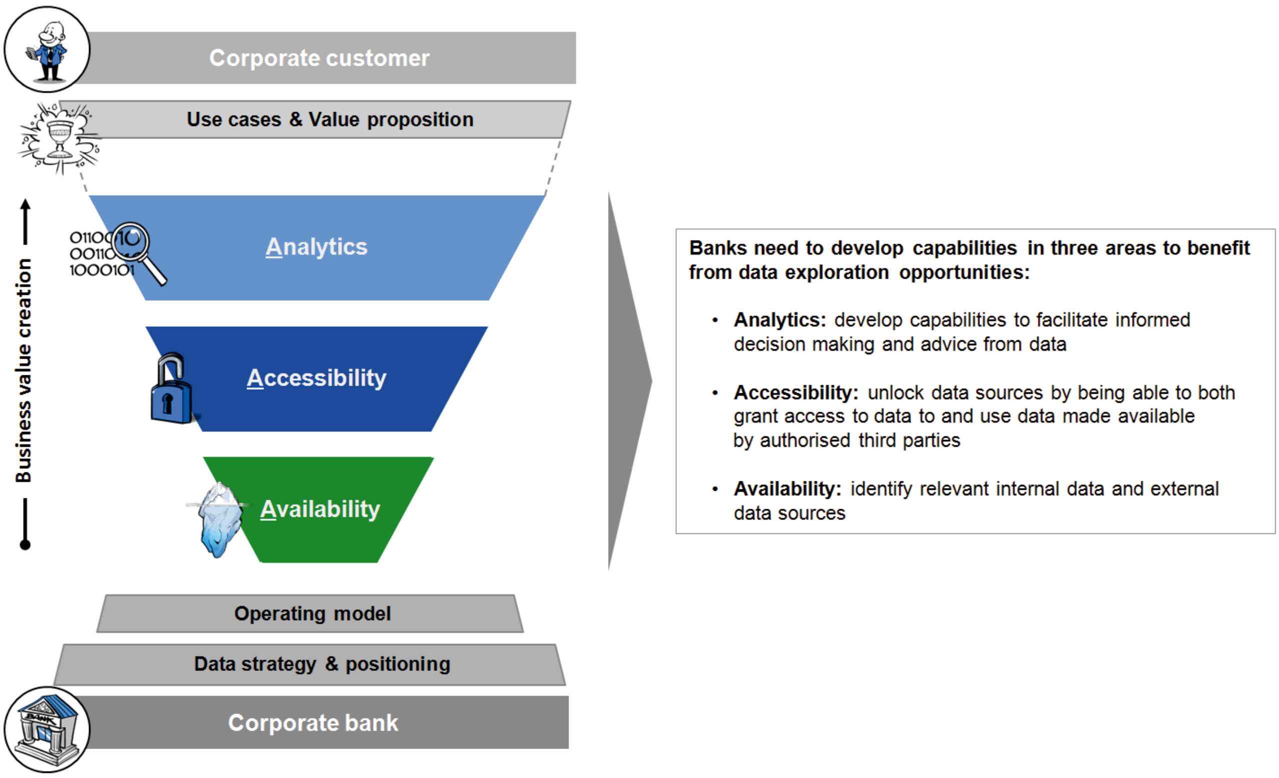

Figure 2: *Triple A model – business value creation stack*

[2] See definition on page 17

It is the mid-layer domain of data accessibility where we observe short-term challenges for corporate banking professionals as this domain is subject to substantial change. PSD2 and GDPR contribute to this change by enabling more data control by customers. This will empower customers to re-use their banking data outside the bank domain, as an increasing number of banks across Europe start 'making APIs available' to meet compliance obligations and explore opportunities in Open Banking. At the same time, banks could also 'consume APIs' provided by other (financial) parties, such as ERP systems, with the consent of, and under the control of their corporate customers to enable data-driven value propositions.

Granting corporate customers more control over their data in a secure and easy manner requires further innovation in the security and digital identity capabilities of banks. Data being a sensitive topic from a compliance and reputational perspective, a policy-based data management is required. That means solid procedures for obtaining and managing (including revoking) customers' consent to use their data. It also implies weighing the (monetary) value of developing data-driven services against the compliance and reputational risks of data mishandling. In addition to IT-related capabilities, banks need to develop the required skills to handle data-driven value creation, to build propositions and to develop effective business models, both by the bank and potentially in close co-operation with Fintech players.

2. INTRODUCTION

For the last two years, the Open Banking Working Group (OBWG)[3] has focused on the development and potential of Open Banking innovation and business models. So far, extensive attention has been devoted to (transactional) retail banking services, with PSD2 as a key driver for opening up data and functionality beyond the initial compliance scope of payment initiation and account information services.

In contrast to corporate banking, the retail banking market is a fast-moving environment where new seamless, digital (transactional) experiences across channels, combined with ever-changing customer behaviour and expectations, require banks to alter and re-define their business models to effectively differentiate their product and service offerings. This potential differentiation can be found in the uptake of digital payments, which enables much more data (e.g. location, behavioural, search, preferences) to be captured across sales channels with each payment. The amount as well as the value of data collected on individual consumers is increasing – thanks to advancements in processing capability, data analytics and data mining to identify customer patterns. We see banks, particularly the so called 'digital challenger or neo-banks', experimenting with such data-driven services to provide personalised financial services to their customers.

The corporate banking market is an intricate environment characterised by regulations (e.g. Anti-Money Laundering (AML), Foreign Account Tax Compliance Act (FATCA), International Financial Reporting Standards (IFRS)), siloed banking relationships and the need for efficiency and cost control. Consequently, digital innovation in (transactional) corporate banking services has been limited for the last few years to increasing efficiency of services (improving straight through processing (STP), digitisation of largely labour intensive, manual processes (e.g. 'Know Your Customer' (KYC), client onboarding, contracting, reconciliation, accounts receivable, invoicing) and improving the usability of services for corporates through standardisation, consolidation and integration of connectivity options and channels.

However, technological advances are increasingly finding their way into the corporate banking market, as evidenced by the emergence and use of open Application Programming Interfaces (APIs), mobile devices and cloud solutions. Open APIs (often combined with cloud technologies) enable banks and corporates alike to make data and functionality available in a secure and cost-effective manner for integration within other applications, effectively creating new value, services and experiences.

The increasing openness of various data sources (both financial and non-financial) held by banks and corporates alike could further drive innovation in transactional corporate banking services (beyond payments) and is therefore a relevant theme to track and understand. Hence, this information paper of the OBWG focuses on data exploration opportunities in corporate banking by describing key concepts and application areas for data-driven business.

To structure the description of this emerging domain, the OBWG defined the layered '**Triple A**' model with a conceptual view of the Business Value Stack, focusing on data **a**vailability, **a**ccessibility and **a**nalytics in the field of corporate banking.

This information paper explores the Triple A model as follows:

Chapter 3: Corporate transaction banking from a data perspective
Chapter 4: A brief exploration of data analytics
Chapter 5: Data analytics application areas: use cases in banking
Chapter 6: Practical considerations in exploring data opportunities
Chapter 7: Conclusion

[3] For further information on the OBWG refer to: https://www.abe-eba.eu/thought-leadership/open-banking-working-group/

3. CORPORATE TRANSACTION BANKING FROM A DATA PERSPECTIVE

This chapter reflects on the corporate value chain and the role and increasing relevance of data. The Triple A model is introduced to structure various developments and dimensions of data and the potential value creation for corporates and corporate banking services. The model refers to three hierarchical layers required for extracting value from data: **a**vailability, **a**ccessibility and **a**nalytics. The increasing availability and accessibility of data open up new options for business value creation using data analytics. Key drivers of the Triple A model include new data sources (internal and external), connectivity options (e.g. APIs), regulatory developments (e.g. PSD2 and GDPR) and Open Banking. These drivers shape a potentially new proposition domain closely related to the Open Banking development, i.e. 'customer in control' of their own data and financial assets. However, as such data-driven propositions are a sensitive topic from a compliance and reputational perspective, banks need to develop clear data management policies.

Our definition of data

Data means many things to many people, and it has also been defined in many ways. For this report, we apply a rather simplified definition of data, i.e. "facts and figures which relay something specific, but which are not organised in any way, and which provide no further information regarding patterns and context"[4]. For data to become information, it must be contextualised and categorised to give it relevance and purpose. Information Technology (IT) is invaluable in the capacity of turning data into information and subsequently into intelligence and insights, particularly in larger businesses, such as banks and corporates that generate vast amounts of data across multiple departments and functions.

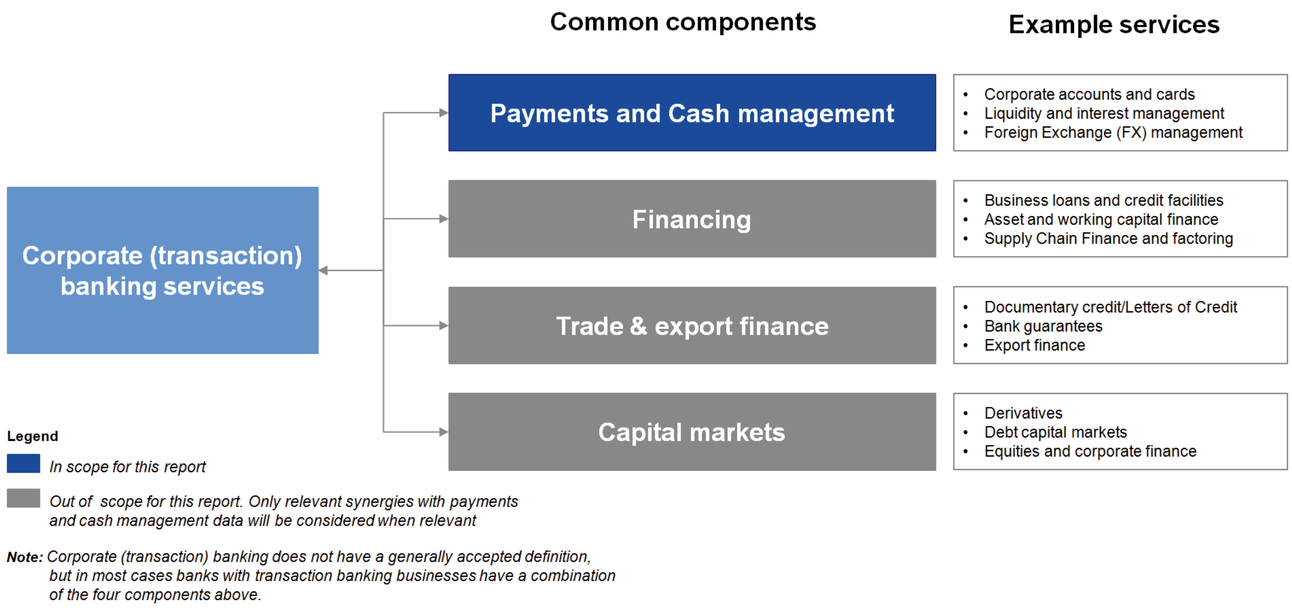

Figure 3: *Four generic components of corporate (transaction) banking services incl. report scoping*

[4] Knowledge Management Systems for Business, Robert J. Thierauf, 1999

3.1 The corporate value chain and relevance of data

Although the nature and scope of corporate (transaction) banking services varies across different banks, most definitions feature some common components. Figure 3 depicts the four generic components of corporate (transaction) banking services.

For this report, corporate (transaction) banking services include traditional payments and cash management, but we will also take a broader look at its context by considering potential synergies with other transaction banking services (e.g. financing) and supporting internal corporate processes (e.g. risk management). Also, when we refer to 'corporates' throughout this report we refer to businesses with more than 250 employees and turnover of 50 MM EUR. 'SMEs' (Small and Medium-Sized Enterprises) are businesses with employees or turnover below said thresholds. Where relevant, we refer to "long-tail" SMEs to indicate the self-employed or micro enterprises.

ERP software essential in data digitisation across the corporate value chain

The traditional payments and cash management services are the result of many transactions within and between corporates that are part of a value chain. These transactions include contracting, ordering, shipment, invoicing and payment. The processes are embedded in corporate supply chains, where the end-consumers also play a role. This can be generically modelled as depicted in the figure below.

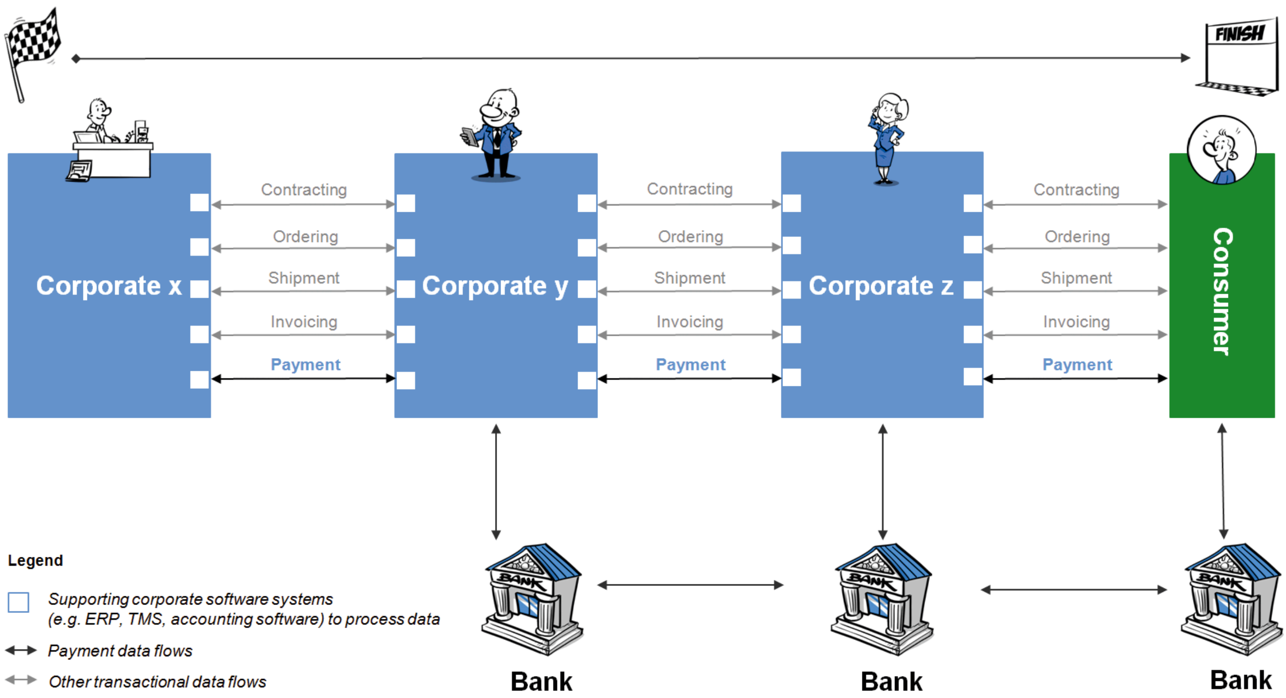

Figure 4: *Transactions (payment and non-payment) within and between corporates in the value chain*

Figure 4 reflects the exchange of transactional data between the software systems of the different corporates. The level of digitisation might differ from corporate to corporate and especially in the long-tail of micro SMEs that largely rely on paper-based processes. The corporate software systems are diverse and could range from advanced ERP systems, cloud-based or on premise administrative software, or relatively simple productivity tools such as Excel. These software solutions can be integrated or scattered into internal 'islands' (as the white squares in Figure 4 illustrate). For this report, we assume that relevant transactional data (payment and non-payment) is digitised in some manner, centrally available or scattered across a corporate's IT landscape.

New connectivity options appeared over time driving B2B interactions

Over the past two decades, we have seen digitisation, mainly **within** corporates and medium-sized enterprises, and to a lesser extent digitisation between corporates. Digitisation **between** corporates is mainly seen in relatively large, complex supply chains where bilateral connectivity is organised once there is a compelling business case to justify the investments. The Electronic Data Interchange (EDI) movement dating back to the 1980s, could be viewed as the first wave of bilateral connectivity solutions and even the 'de facto' standard in the (large) corporate integration space for business-to-business (B2B) interactions. Over time, new connectivity options (e.g. SOAP, XML) became available in the 1990s as technology evolved and the advance of the Internet, making bilateral connectivity reachable for smaller corporates. By driving the use of Application Programming Interfaces (APIs, e.g. REST) for B2B integration and interaction, the current Open Banking movement is leading the next generation connectivity option. The use of APIs provides benefits in terms of speed, standardisation, simplification, scalability and cost-effectiveness, and has the potential to increase connectivity even further.

From value chains to value networks, transforming B2B relationships

We are entering an era of machine-to-machine (M2M, including Internet of Things (IoT)) messaging enabled by Open Banking and the use of APIs that will transform B2B relationships, i.e. relationships between corporates, and between corporates and their banks. We have the technology today to turn a traditionally linear supply chain into a 'digitised multi-party network' that can take forward demand and translate this to the supply chain actor's software systems (e.g. ERP) in real-time. The type of information being shared can be far richer than EDI, is more free-flowing, situational, and does not require laboriously building bilateral connections between trading partners in a value chain. This development is expected to drive data availability, accessibility and analytics, as explained in the next section.

3.2 The Triple A model of data: availability, accessibility and analytics

The Triple A model provides a conceptual view of the business value creation stack, focusing on data **a**vailability, **a**ccessibility and **a**nalytics in the field of corporate transaction banking, as depicted in the figure below.

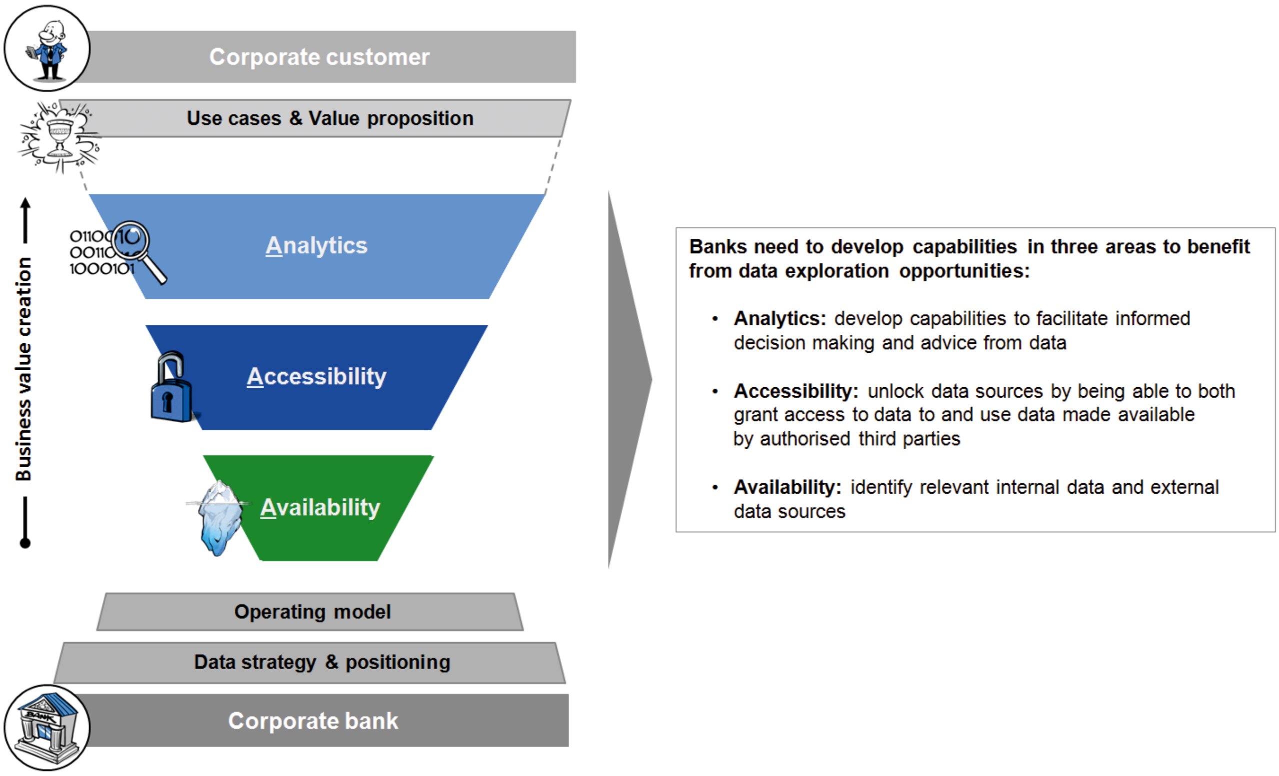

Figure 5: *Triple A model – business value creation stack*

Data Availability

The universe of data sources has changed vastly over the past few years. Information technology is unlocking (hitherto un-/underutilised) data from sources within the organisation (across silos/departments), potentially supplemented with external data sources. In parallel to the increasing volume of information growing rapidly, opportunities to expand insights by combining data are accelerating, ultimately making it an invaluable ingredient for informed decision making.

Bigger and smarter data give companies both more holistic and more granular views of their business environment. The ability to see what was previously invisible improves operations, customer experiences, and strategy. Therefore, new internal and external sources of data bear a great potential. An effective way to prompt broader thinking about potential data sources is to ask, “what decisions could we make if we had all the information we need?” In today’s digital era, this information is likely to be available in one way or the other.

Internal and external data sources

Internal data is generated from internal processes, products, channels and human interactions through account/relationship managers. The digitisation of internal processes generates even more data that can be applied in support of value creation to the end customer. External data sources can come in many different forms and from different third-party sources. From a bank's perspective, these sources can be the corporate with whom they have a (contractual) relationship or other sources, such as government entities, other banks, (company/market) statistics companies, social media, (credit) reference agencies.

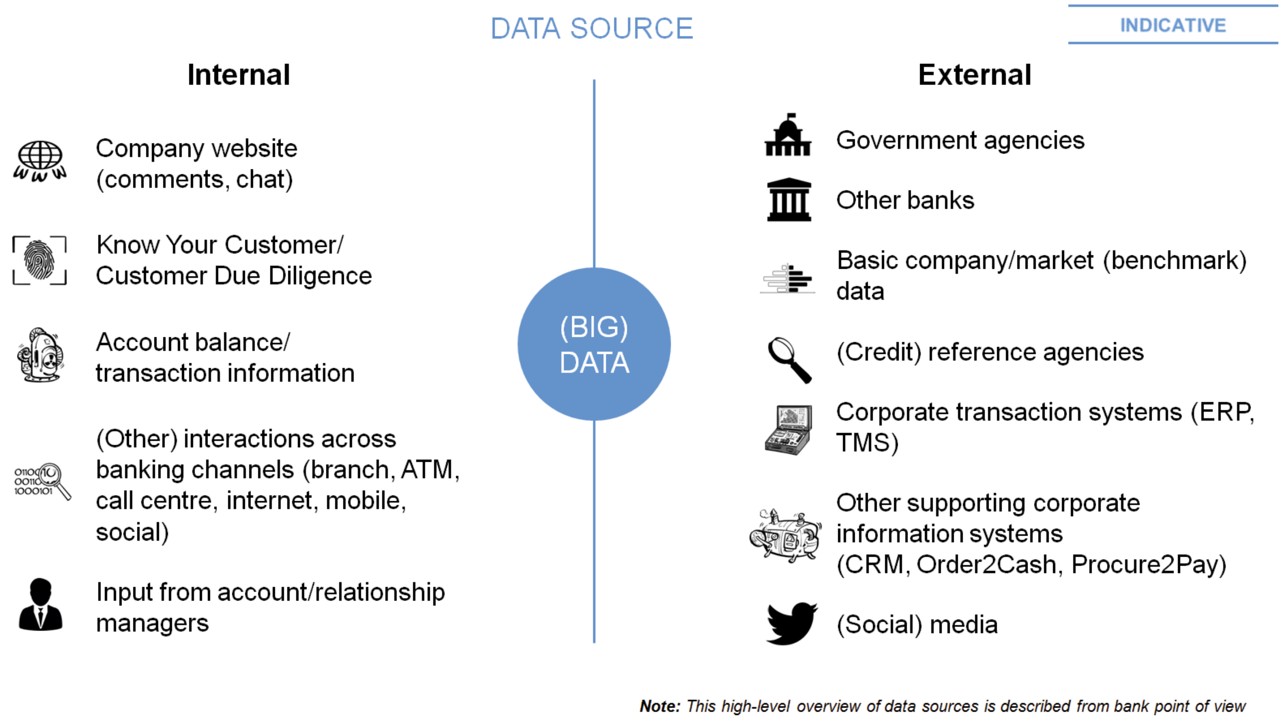

Figure 6: *High-level view of available data sources from a bank point of view*

Structured and unstructured data

The number of data sources has increased with technological progress, while the content has increased in both richness and diversity. With the evolution of, among others, Internet of Things (IoT), sensors and smart devices, the physical world has become increasingly connected to the digital world. Combining data from multiple sources potentially generates valuable insights in (human) behaviour, thus allowing for improved and new products and services that meet customer needs.

Depending on the source from which data is harvested, data can come in both **structured** and **unstructured** form. Structured data is (mostly numerical) data stored in databases with orderly columns and rows where the meaning of each data item is clearly defined. Roughly 10% of all data is structured. This data is accessible through a database management system or website. Internal databases (e.g. CRM, transaction overview etc.), government websites and national statistic reports are examples of structured data sets. Analysing structured datasets requires relatively little computing power.

Unstructured data comprises the other 90% of the total stream of data. This type of data is different from structured data in the sense that it is not available in an organised manner. Unstructured data can consist of texts, images, videos and audio files from diverse sources. Social media has become a major source of unstructured data. Datasets of unstructured data are typically very large.

Data Accessibility

Next to unlocking data **within** organisations, information technologies (e.g. APIs) can now also be used **between** organisations, offering the opportunity of seamlessly and efficiently exchanging data between corporates along supply chains and between banks and corporates.

Accessibility of different data types

Different types of data are to a greater or lesser degree suitable for an exchange between organisations. This is illustrated by the following categorisation of data types, drawn from the UK Open Banking Standard:

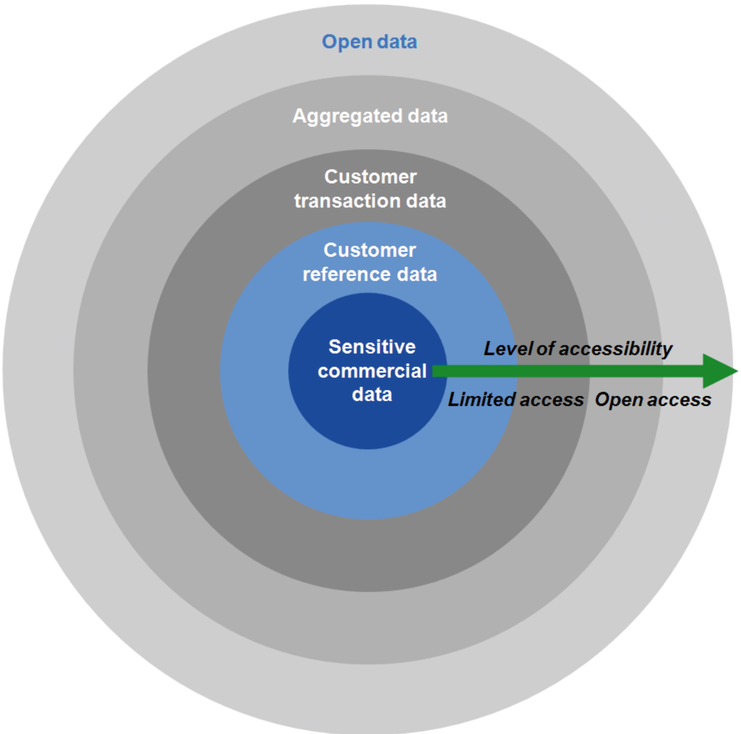

Figure 7: *Overview of data types with varying levels of accessibility*

The categories of data visualised in the figure above can be defined as follows:

- **Open data** can be accessed, used or shared by anyone.
- **Aggregated data** is a set of averaged or aggregated data across transactions, balances, other customer data or open data sources that is anonymised and cannot be de-anonymised.
- **Customer transaction data** is presented to customers in their financial statements and relates to a customer's account through which payments can be initiated.
- **Customer reference data** is about an individual or business that is not directly related to the use of an account, e.g. data that is collected from or generated for a customer as part of an eligibility check, or during the onboarding process. Examples include data relating to Know Your Customer (KYC) processes, anti-money laundering (AML) checks or credit scores.
- **Sensitive commercial data** contains classified internal information including documents, strategy, price setting, policies, algorithms and data provided under licence.

In addition to data types, two types of access rights can be defined:

- **Read access**: permission that is granted to a third party enabling them to read but not modify a file, set of files, or set of data.
- **Write access**: permission that is granted to a third party to modify or execute a file, set of files, or set of data. In the context of this report, write access includes payment initiation.

In practical terms, this spectrum of varying data accessibility and read/write access defines the accompanying access tools and processes (logins, authentication, issuing process) provided to users of this data, corporates and bank staff. More information is provided below on the driving forces behind data accessibility and requirements imposed on tools/processes to access this data.

Accelerated data accessibility driven by PSD2 and GDPR

Under the PSD2 (effective as of January 2018), corporate (and retail) customers will have the right to authorise third party applications to connect to their payment accounts for the purpose of payment initiation and account information services. In other words, customers receive more control on how they wish to handle their data residing within the banks. Essentially, PSD2 triggers banks to rethink the way data is used, shared and made available, potentially via authorised third parties, to their corporate (and retail) customers.

GDPR is also increasing (data) control by customers (i.e. natural persons) and will become enforceable in May 2018. Under the GDPR, customers must provide verifiable consent to organisations before organisations can use their personal data. Customers will also be given the 'right to be forgotten' and to retrieve their personal data for re-use at other service providers of choice, thereby preventing 'lock-in'. The GDPR revises the regulatory framework for processing personal data.

Advances in data accessibility and regulation allows customers to be in control

PSD2 and GDPR shape a potentially new proposition domain closely related to the Open Banking development: putting the 'customer in control'[5]. Banks will need to think of innovative tools and technologies to put their customers and their customers' customers 'in control' of their data and financial assets, while taking into account compliance, security and usability aspects. Enhancing and advancing 'data access infrastructures' with digital identity technologies is essential to make the most of the increased data availability and accessibility. This accessibility is a precondition for enabling innovative data analytics applications and, in turn, enabling effective 'customer in control' propositions in an Open Banking era, where a new B2B2C proposition space is opening up, which innovative Fintech players are already beginning to occupy.

Digital identity tools are indispensable for data accessibility infrastructure

Security and compliance are a 'conditio sine qua non' for banks to operate. Know-Your-Customer (KYC) is essential for the banking business. Banks must be able to identify customers and to verify their identity when offering banking services; these are prerequisites for secure banking operations. Banks have historically used digital identities in their own context for information security purposes. However, in the digital age digital identities can increasingly be applied beyond the banking domain.

Putting the 'customer in control' provides opportunities to offer digital identity 'as a service' through APIs by authorised third parties based on customer data held by banks. Examples are consent manage-

[5] Open Banking: advancing customer-centricity. Analysis and overview. (Open Banking Working Group, EBA information paper, May 2017)

ment, including the possibility to view and revoke consent, e.g. enabling bank customers to re-use their banking credentials to log in to authorised third party applications and to authorise the third party to act on the customer's behalf including the possibility to review one's prior authorisations and to revoke them. The user experience of such propositions should ideally build on already existing digital identity user experiences, e.g. through mobile apps, SMS or one-time codes, such as a transaction authentication number (TAN), and might resemble what many people have become accustomed to when using the "login with" functionality of their Twitter, Facebook and Google accounts.

Each bank can pursue an individual strategy or collaborate to create a generic data-access infrastructure. Initially, we expect to see a variety of solutions, ultimately converging into a network with substantial reachability and a harmonised, recognisable user experience. The PSD2 'Access to Account' provisions initiate standardisation attempts [6,7] (e.g. Berlin Group, UK Open Banking Working Group) in a world of many individual initiatives in providing API access to customer data.

Data Analytics

Increased availability and accessibility of data creates new opportunities for business value extraction. Data analytics can be used to analyse data in **hindsight** (descriptive, diagnostic), or to create forecasts (**foresight** – predictive, prescriptive). Data analytics is a very dynamic field, driven by numerous, interlinked technological developments including but not limited to machine learning, cloud computing, artificial intelligence, robotics process automation, Internet of Things (IoT) and Distributed Ledger Technologies (DLT). These technologies will be further explored in the next chapter.

The activity of any organisation and more broadly speaking our day-to-day lives increasingly rely on data analysis to facilitate informed decision making. The corporate transaction banking world is not an exception. In the same way that banks today are trusted with customers' funds, confidential information, and distributing and allocating risk, banks can play a role in collecting, protecting, sharing and analysing data securely and efficiently.

The process of deriving intelligence from available and accessible data, as well as the required, enabling technologies are further explored in Chapter 3.

3.3 Open Banking as a catalyst for data-driven corporate banking services

The PSD2[8] access to account provisions will give customers control over how they wish to connect authorised third party applications to their payment accounts for initiating payments and accessing transaction data. This has triggered a broader discussion around 'opening up' more than is required for compliance. Open Banking is a trend that sees banks considering ways to allow access to account and related services, typically through Open APIs, and allowing authorised third parties to embed various transactional, multi-banking functionalities into their applications. Indeed, there is a general trend emerging in banking (especially payments) and other industries towards an 'API economy' where more open business models are essential to compete and collaborate.

[6] Payment Services Directive 2: PSD2 sparks innovation in Open Banking ecosystems: https://www.innopay.com/blog/payment-services-directive-2-psd2-sparks-innovation-in-open-banking-ecosystems/

[7] See also "Open Forum on Open Banking – Proposed Terms of Reference" (https://www.abe-eba.eu/downloads/open-forum-on-open-banking/EBA_20160820_ToR_Open_Forum_on_Open_Banking_v1-0.pdf) and Understanding the business relevance of Open APIs and Open Banking for banks (https://www.abe-eba.eu/downloads/knowledge-and-research/EBA_May2016_eAPWG_Understanding_the_business_relevance_of_Open_APIs_and_Open_Banking_for_banks.pdf)

[8] Revised Payment Services Directive: PSD2 sparks innovation in Open Banking ecosystems: https://www.innopay.com/blog/payment-services-directive-2-psd2-sparks-innovation-in-open-banking-ecosystems/

Figure 8 depicts three emerging domains for data-driven corporate banking services in an Open Banking era:

1. Banks ***making available*** APIs to corporates and their software solution providers;

2. Banks ***using*** APIs provided by corporates, effectively making the bank an 'API consumer';

3. Banks performing ***data analytics*** on internal and external data, i.e. payments data enriched with data sources from corporates.

Note that data analytics can also be conducted by the corporates themselves, but this is considered out of scope for this report. In addition, banks can also obtain data from third-party sources other than corporates, which will only be considered if deemed relevant from a corporate transactional banking point of view.

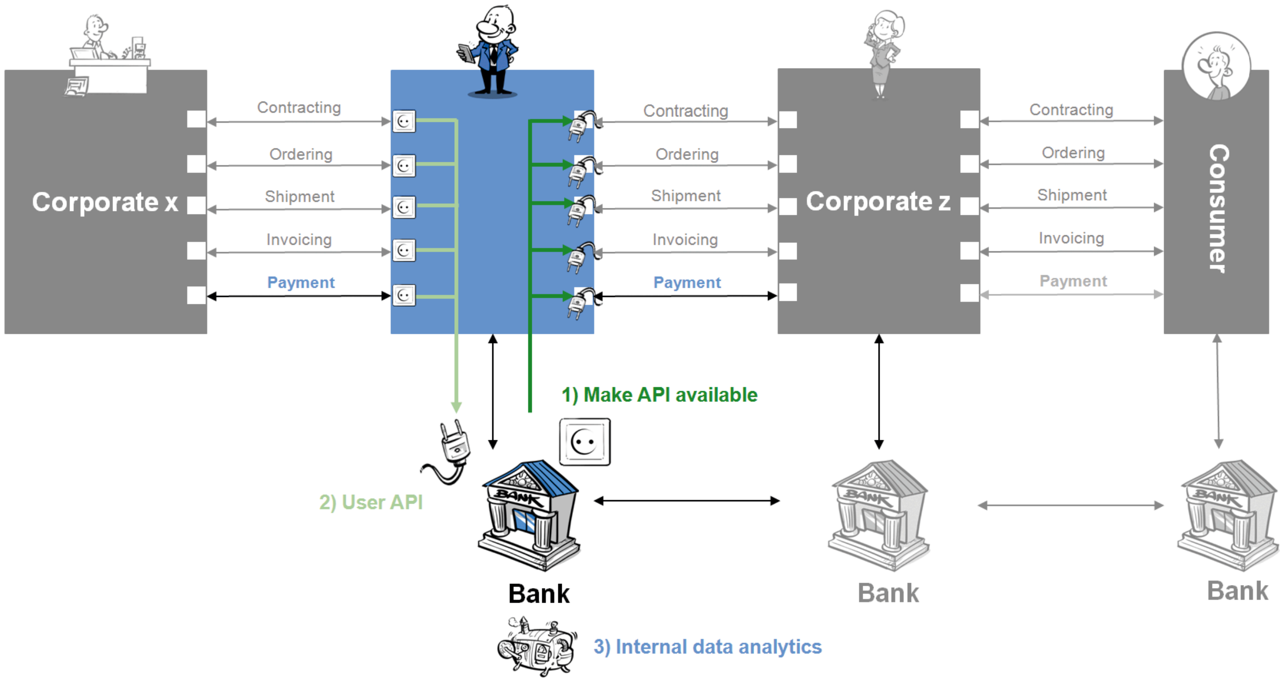

Figure 8: *Three domains for Open Banking innovation in corporate banking services*

This section explores further how banks can make APIs available, while Chapter 3 continues with a more detailed description of banks using APIs and areas in which data analytics can be applied.

Using APIs in Open Banking

Open APIs and Open Banking have gained traction and have progressed from being purely technical topics to being of business relevance for banking practitioners and strategic board level agenda items. As exemplified by companies with a digital focus (e.g. Google, Apple, Facebook, Amazon, and Twitter) APIs are a major contributing factor in enabling these businesses to grow very rapidly in a relatively brief period. Opening up towards other market participants outside of one's own organisation has proven to create value for customers and to benefit the surrounding ecosystem.

Today's Fintech movement and the PSD2 provisions for 'access to account' have fostered competition and digital innovation that are transforming the financial services industry. Consequently, the financial services industry's interest in Open APIs and Open Banking is gaining momentum and is not limited to payments. This is evidenced by banks across Europe launching API developer portals and setting up developer programs and hackathons with the aim of attracting developers, technology companies, start-ups, 'technopreneurs' and students to their APIs to create 'next generation' banking applications[9]. The figure below shows a timeline featuring banks that have launched an Open API developer portal.

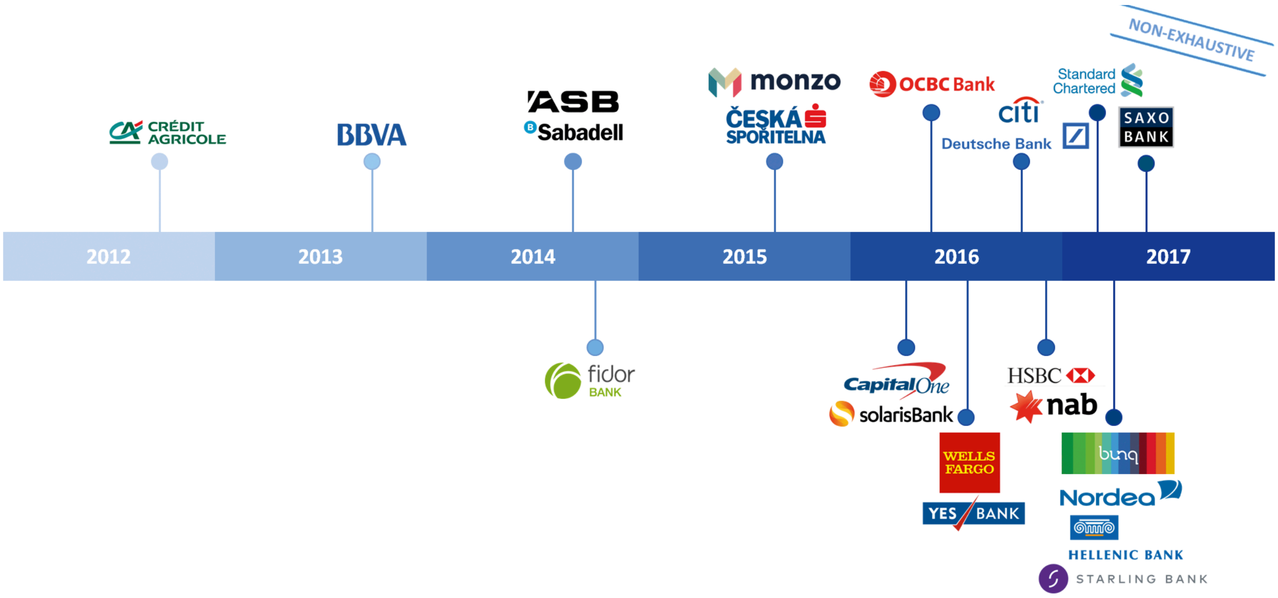

Figure 9: *Innopay Open Banking Monitor*[10]

The number of APIs made available through the banks' developer portals tends to differ as well as the functional scope and level of openness of the APIs. Indeed, Open APIs enable secure, controlled and cost-effective access to data and/or functionality by authorised third parties. 'Open' does not mean that every third party can access a bank's system at its own discretion. Bank customers will always be able to exercise some form of control to preserve security, privacy and contractual conditions. In practice, different levels of API openness can be observed: *private, partner, member, acquaintance*, and *public* API[11]. This is important because the level of API openness determines the potential number of parties with access and thus the potential reach of the data and functionality offered through the API.

Although several banks have already launched a developer portal, many of the API offerings are still in a BETA phase and are typically restricted for use by a limited number of ('partner') developers. The figure below depicts a generic and (over-)simplified view of APIs being offered in developer portals included in this high-level assessment[12]. The vertical axis shows the 'functional scope' of the API in terms of functionality (i.e. result of applied logic to certain input), data (i.e. raw data or combination of raw data sets) or product information (i.e. pertaining to the product catalogue of a respective bank). The horizontal axis shows the (product) 'domain' to which the functional scope relates.

[9] Innopay Open Banking Monitor: https://www.innopay.com/themes/apis/openbankingmonitor/

[10] This figure is non-exhaustive and for illustration purposes only.

[11] Open Banking: Evolution of banking, leading to more transparency, customer choice and customer control over personal data (see also: EBA information paper, May 2015: 'Understanding the business relevance of Open APIs and Open Banking for banks')

[12] Innopay Open Banking Monitor (2017); https://www.innopay.com/themes/apis/openbankingmonitor/

NON-EXHAUSTIVE

	Lending	General bank information	Payment account	Digital Identity	Cards	...	...	...
Functionality	• Calculate max amount • …	• …	• Money transfer • Create account • …	• Authentication • Onboarding • …	• Manage • …	‘Many Open Banking opportunities are being further assessed as part of bank API strategies’		
Data	• Loan conditions • …	• ATM locator • Branch locator • …	• Transactions • Balance • Accounts • Loyalty points • User info • …	• …	• Transactions • Loyalty points • …			
Product information	• SME offering • …	• …	• Corporate • Retail • …	• …	• Card offering • …			

Figure 10: *Example of functional scope of API developer portals in banks*[13]

Triggered by PSD2, banks across Europe are further assessing their API strategy and Open API propositions. Following a start in retail banking business, the corporate segment is gaining more traction as evidenced by Open APIs specifically targeted to corporate customers. This is expected to further drive the data availability and accessibility, and ultimately the analytics of data in the field of corporate transaction banking.

3.4 Key take-aways and implications for banks

In summary, the key take-aways from this chapter include:

- **Data is increasing in volume, as well as in variety and velocity.** The number of potential data sources are manifold: internal and external data sources play key roles when assessing data exploration opportunities.

- **Evolving connectivity technologies are enabling us to enter an era of machine-to-machine messaging enabled through Open Banking and the use of APIs that will transform B2B relationships**, i.e. between corporates, and between corporates and their bank(s).

- **We have the technology today to turn a traditionally linear supply chain into a ‘digitised value network or ecosystem’** – which is characterised by collaboration, integration and openness to create next generation corporate banking services.

- **Technology and connectivity advances will drive data availability, accessibility and analytics, which in this report is referred to as the Triple A model.** The model depicts the business value creation stack, moving from data availability, to accessibility and analytics in the field of corporate transaction banking. The value of data tends to increase the more we move towards actionable data sets that can be used for analytics purposes, providing tailored, real-time offerings and advice.

[13] This figure is non-exhaustive and for illustration purposes only.

- **Data accessibility is driven by regulatory developments such as PSD2 and GDPR, which are expected to open up new business propositions** closely related to the Open Banking development, i.e. 'customer in control' of their own data and financial assets.

- **Data being a sensitive topic from a compliance and reputational perspective, a policy-based data management is required.** That means solid procedures for obtaining and managing (including revoking) customer's consent to use their data. It also implies weighing the (monetary) value of developing data-driven services against the compliance/reputational risk of providing incorrect or unwanted conclusions.

The resulting key implications that can be derived for banks include:

- **Banks will need to think of innovative tools and technologies to put their (corporate) customers 'in control' in an Open Banking era**, taking into account compliance, security and usability aspects. Digital identity tools are indispensable for a secure and effective data accessibility infrastructure, considering the increasing relevance of data protection and privacy.

- **With improved data availability (both internal and external) and accessibility, data analytics open up new possibilities for the creation of business value.** The corporate transaction banking world is no exception. In the same way that banks today are trusted with customers' funds, confidential information, and distributing and allocating risk, banks can play a role in collecting, protecting, sharing and analysing data securely and efficiently.

- **From a trust and data availability point of view, transaction banks are in a pole position to play a leading role in the data analytics domain**, i.e. in the same way that these banks are today trusted with funds, confidential information, and distributing and allocating risk. Banks can play a key role in collecting, protecting, sharing and analysing data securely and efficiently in an increasingly 'open' financial ecosystem.

- **Banks with corporate banking activities should define their strategic position in emerging value networks/ecosystems** (strategy, positioning, partnerships) by re-thinking the status quo in 'production' and 'distribution' of their corporate banking services in view of increasing possibilities for data exploration.

In the next chapter, we provide a brief examination of relevant data analytics concepts.

4. A BRIEF EXPLORATION OF DATA ANALYTICS

In the previous chapter, we introduced the Triple A model and explored the two layers of data 'availability' and 'accessibility'. This chapter focuses on the 'analytics' layer and introduces relevant concepts, technologies and processes for deriving intelligence from data.

4.1 Deriving intelligence from (available) data

Data has the potential to transform organisations and disrupt markets once insights are leveraged to drive smart, actionable (financial) decision making. Analysis of data to extract insights and intelligence can be enabled by four techniques: *descriptive, diagnostic, predictive* and *prescriptive analytics*. While the first two types are used to gain insights in 'hindsight', the latter two types help to 'foresee' what is likely to happen in the future ('foresight'). From a technology perspective, data analytics benefit from cloud technologies which serve as an infrastructural basis for applications such as big data, artificial intelligence and robotics process automation. Appropriate use of these technologies helps to extract optimal value out of data analytics. The figure below depicts the four analytics techniques in relation to the level of intelligence and business value they deliver.

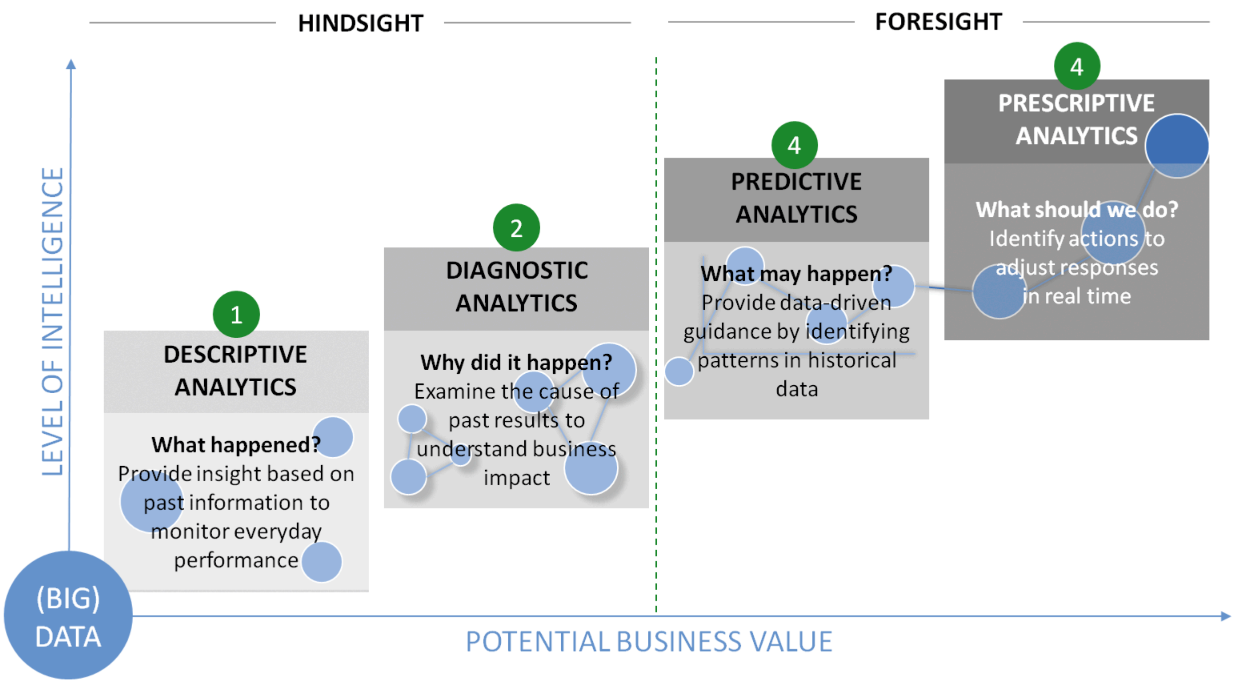

Figure 11: *Four analytics techniques with varying levels of intelligence and business value generated*

As shown in Figure 11, descriptive and diagnostic analytics are used to structure and examine known, historical data.

1. *Descriptive analytics* provide insights based on analysis of historical data. Standard report generation and monitoring of company data are examples of use cases appropriate for descriptive analytics.

2. *Diagnostic analytics* is used to identify the cause of outcomes of past events based on historical data. Example use cases are variance analyses and interactive dashboards.

Predictive and prescriptive analytics, on the other hand, are used to forecast future events. Historical data is assessed to identify patterns and interpret the meaning and consequences of these patterns.

3. *Predictive analytics* assists in predicting future events by searching for patterns in historical data. It can, for example, be used to predict an accounts receivable balance or collection period of (corporate) customers.

4. *Prescriptive analytics* assists decision making in that it helps to identify the optimal decision to achieve a desired outcome. It is not only about what will happen, but also why it will happen, whilst providing recommendations regarding actions that will take advantage of the predictions. Prescriptive analytics differs from the other techniques in that it provides recommendations on one or more choices. Therefore, the 'output' always needs to be carefully analysed against robust expectations, especially at the beginning of the 'learning process'. Examples of prescriptive analytics include fraud prevention and optimisation of processes (e.g. supply chain, resource or interest rate and other market returns received on investments or scheduling inventory in the supply chain).[14,15]

The above shows that analytics has various meanings and purposes. Therefore, banks must answer fundamental strategic questions when embarking on a data analytics project. The questions include '*how does data analytics support our business strategy?*' and '*which are the questions we need to ask ourselves to get actionable insights?*'. Much of data analytics results are based on pattern correlations, which are not necessarily causal, so the risk is that conclusions (e.g. on customers' preferences or upsell potential) are off-track. To mitigate this risk, it is important to remain critical and to allow for trial and error on this journey.

Evolving technology accelerates data analytics concepts. The next paragraph elaborates on the technologies most relevant for data analytics.

4.2 Relevant technologies for data analytics

Now that we have defined the four data analytics techniques, we will look more closely at the role of relevant technologies for data analytics in banking.

Classifying technologies in the field of data analytics is hardly possible without an overlap in terminology, therefore we will use 'tags' to qualify these technologies for the purpose of this report.

Cloud computing – tags: infrastructure, storage, data source, application

The easiest definition of a cloud computer is 'using someone else's computer'. Cloud computing is based on a very old concept dating back to the days of centralised mainframe computing (1960-1980) where users used programs via 'dumb' terminals without any graphics capabilities. With the advent of more intelligent terminals (personal computers) with local and private networking capabilities hybrid models appeared. With the development of the Internet bandwidth became pervasive, high performing and affordable. Outsourcing of computing and data storage, which is now commonly referred to as cloud computing, became possible. Examples of such service offerings are Amazon Web Services (AWS) and Azure by Microsoft. Financial institutions have been looking into utilising the cloud as well.[16,17]

14 Descriptive, Predictive, and Prescriptive Analytics Explained, Halobi

15 Why UPS spends over $ 1 Billion on Big Data Annually, On self-driving cars, Datafloq 2017

16 Amazon Cloud Is Not Really New to Banks, Fortune, 2016

17 Banking on the cloud, McKinsey, 2016

Benefits of cloud computing can lead to operational cost reductions, agility and resilience, which translates into lower Total Cost of Ownership (TCO) of IT operations. Potential risks include regulatory risks (depending on the jurisdiction), third party dependency and security concerns.

For data analytics, cloud computing is important because it allows for rapidly upgradable storage and instant processing of substantial amounts of data in a scalable fashion that is easy to set up. Cloud computing often has pay-as-you-go pricing models.

Big Data – tags: data sources, storage, applications

Big Data refers to the sourcing, shaping and handling of large data sets, which can be either structured (e.g. transactional data) or unstructured (e.g. text or video). It is therefore a large term, encompassing various technologies for storage (e.g. Hadoop and HDInsight for high availability of data warehouses), processing (e.g. SQL) and newer protocols such as Presto and NoSQL (for unstructured data) and Sqoop (for transfer). For example, a major North American bank became data-led by building a platform on Hadoop and sourcing data sets from different applications that combine multi-structured data streams from transactional stores, customer feedback, and business process data sources[18].

Artificial intelligence – tags: application

Since the 1950s, Artificial Intelligence (AI) has been on the agenda of scientists in their search to mimic the human brain with computers. The past decade advanced AI tremendously thanks to progress in data availability, processing power and algorithms. We distinguish applied and general AI.[19] General AI focuses on 'any' task, where applied AI solves specific problems. Machine Learning (ML) is another a common term and can be regarded as a subset of AI. It is generally AI that drives developments of ML, and this is most challenging as computers need to be able to learn by themselves. Deep Learning refers to a specific type of ML, in which layered protocols enhance the learning results. The teaching capabilities of ML stem from developments in neural networks, which aim to simulate the human brain.

Machine Learning can be categorised as follows:

1. **Classification**: A Big Data set is used to identify the maximally distinguishing attributes associated with classes or clusters of data. Once the classes are identified, new examples can be analysed and appropriately categorised (e.g. classification tasks include categorising risk-return characteristics of stock, bonds and mutual funds, and determining the creditworthiness of a credit application).

2. **Prediction**: Involves finding possible future values and/or distributions of attributes of interest based on the analysed data. A key task is identification of attributes that most strongly influence the attributes being predicted. This domain addresses, among other things, forecasting faults in telecommunication networks and predicting market performance of products.

3. **Association**: Identifies rules that govern the relationship among groups of attributes and/or entities. Examples include, market basket analysis focused on identifying a group of products that tend to sell together, or analyses that associate symptoms with diseases.

4. **Detection**: This includes detection of anomalous behaviour, exceptions, counter-intuitive data values, and irregular patterns in data sets, and seeks to explain the cause of such irregularities. For example, churn management, which involves identifying profiles of customers that are likely to switch to a competitor.

[18] Big Data In Banking: How Citibank Delivers Real Business Benefits With Its Data-First Approach, Forbes, 2016
[19] Forbes, December 2016

Machine Learning (ML)[20] can be either **supervised, semi-supervised** or **unsupervised**:

- In **supervised** ML, the starting point is a data set with known correct values ('labelled'); it also can be seen as having a sense of direction identified.
- In **unsupervised** ML, there are no correct or incorrect answers ('unlabelled'), as there is no knowledge of the data upfront. Unsupervised ML algorithms try to find clusters of data that are somehow related. It could be deployed to recognise behavioural changes, e.g. for fraud detection, since there is no upfront knowledge of how the behaviour might change. Another example might be to try to find market segments in a customer database.
- In **semi-supervised** ML, the input data is a mixture of labelled and unlabelled examples.

Note: the term supervised learning stems from the process of an algorithm learning from the training dataset, which can be thought of as a teacher supervising the learning process. It has no relation to the supervision of banks or other market actors in the sense of regulatory supervision.

Robotics Process Automation – tags: application, storage, data sources

Robotic Process Automation (RPA) refers to the automation of routine processes to capture and interpret existing means of various processes. As such RPA is a 'container' term, which includes many technologies, but is commonly used in organisations to automate manual and repetitive tasks. This enables faster, more accurate and continuous 24/7 processing. RPA is often used in complex analytics techniques, i.e. prescriptive analytics. RPA can be applied in mortgage approvals, using data from several sources to perform calculations and make decisions, or in the notification of delinquent loans, sending emails and letters to clients.

The technologies and concept described above are summarised in Figure 12.

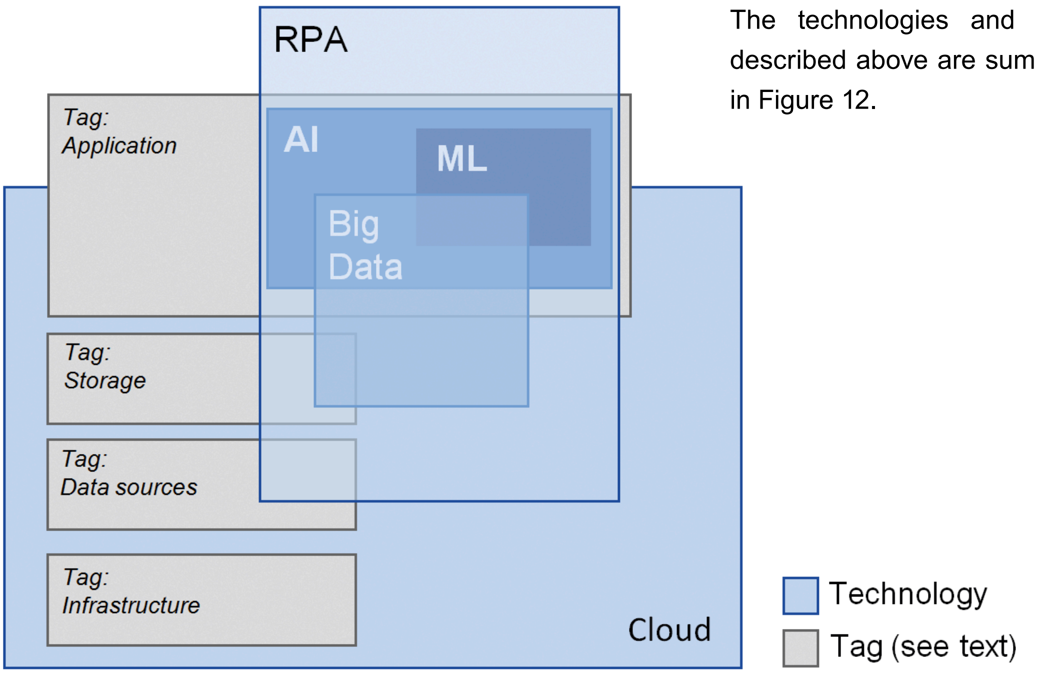

Figure 12: *Correlation of data-related technologies*

[20] Machine learning is now used in Wall Street deal making, and bankers should probably be worried, Business Insider, 2017

In summary, decision makers should be aware of the many dimensions of data analytics if they want to reap maximum value from the rapidly evolving technology lying beneath the different analytics techniques outlined above.

4.3 Key take-aways and implications for banks

In summary, the key take-aways of this chapter include:

- **Value creation from data analytics can be derived from four analytics techniques**, which can be used to analyse data in hindsight (descriptive, diagostic), or to gain insight and intelligence by creating forecasts (predictive, prescriptive).
- **Each technique can be used for a specific purpose providing an answer to a specific question.** Selecting the right technique requires corporate banks to have a clear understanding of the question they are trying to get answered.
- **Evolving technological capabilities such Cloud Computing, Big Data, AI, ML, RPA, are enabling technologies simultaneously improving the four described analytics techniques.** These enabling technologies are commonly used in combination with each other to get the result or insight which is needed.
- **Application of innovative data analytics techniques and technologies at banks have primarily focused on internal value creation**, e.g. more insight in customer needs, detect fraud in real time and better service customers in a substantially cost-effective manner vis-à-vis today's practices. Apart from this internal value creation with data analytics, exploration of external value creation (i.e. data and analytics as a value proposition to corporates and new revenue generator) has been aspirational so far.

The resulting key implications that can be derived for banks include:

- **Data and analytics is the fuel for internal value creation (efficiency, automation), but also for external value creation** enabled by corporate banking service innovation.
- **Banks should formulate a common answer to fundamental strategic questions** such as '*how does data analytics support the business strategy?*' and '*which questions need to be answered?*'. This is the basis for determining the required data and analytics techniques and technologies.
- **Once answers are generated from the data analytics process, one needs to be critical regarding the conclusions.** Results are largely based on predictions by correlations and risk, for example, that conclusions regarding customers' preferences or causality between variables may be off track.
- **Banks should be wary of potential restrictions defined by evolving and emerging (local) regulations** when it comes to data exploration opportunities.

In the next chapter, we further explore, categorise and describe the relevant application areas of data analytics in corporate banking.

5. DATA ANALYTICS APPLICATION AREAS: USE CASES IN BANKING

The key drivers underpinning the 'Triple A' model and relevant concepts and technologies pertaining to data analytics, this chapter's focus is on today's application areas of data analytics in banking.

Value creation from data analytics in the corporate banking domain is mainly internally oriented and includes application areas such as improved product development, targeted market/sales efforts, operational efficiencies, and better risk and fraud management. Analytics provide a good source of creating potentially priceable service components. While banks have access to their own internal data, this is mostly not sufficiently unique to allow unlocking specific, actionable insights critical to maximise the value of data analytics and differentiate their value proposition towards corporates.

Many Fintech initiatives have emerged, developing innovative, value generating services based on corporate banking data, provided under the corporate's mandate. Fintech and bank partnership models could create win-win value propositions to generate returns commensurate with investments by collecting vast amounts of data and enabling secure and seamless accessibility to this data.

5.1 Positioning of data analytics in the corporate value chain

The 'paradox of data analytics' is driving innovation today: on the one hand, Fintech innovators have devised strong learning algorithms which can provide actionable insights, but do not own most of the data present at banks and corporates. On the other hand, there are the banks who own large data sets (on behalf of their customers), but who do not have the most sophisticated algorithms and capabilities to derive value from analytics.

As a result, we see a growing number of banks, Fintech and corporate initiatives, some of which are depicted in the figure below, which is derived from Figure 8 in Chapter 2 and shows that data initiatives can be placed in various positions along the corporate value chain.

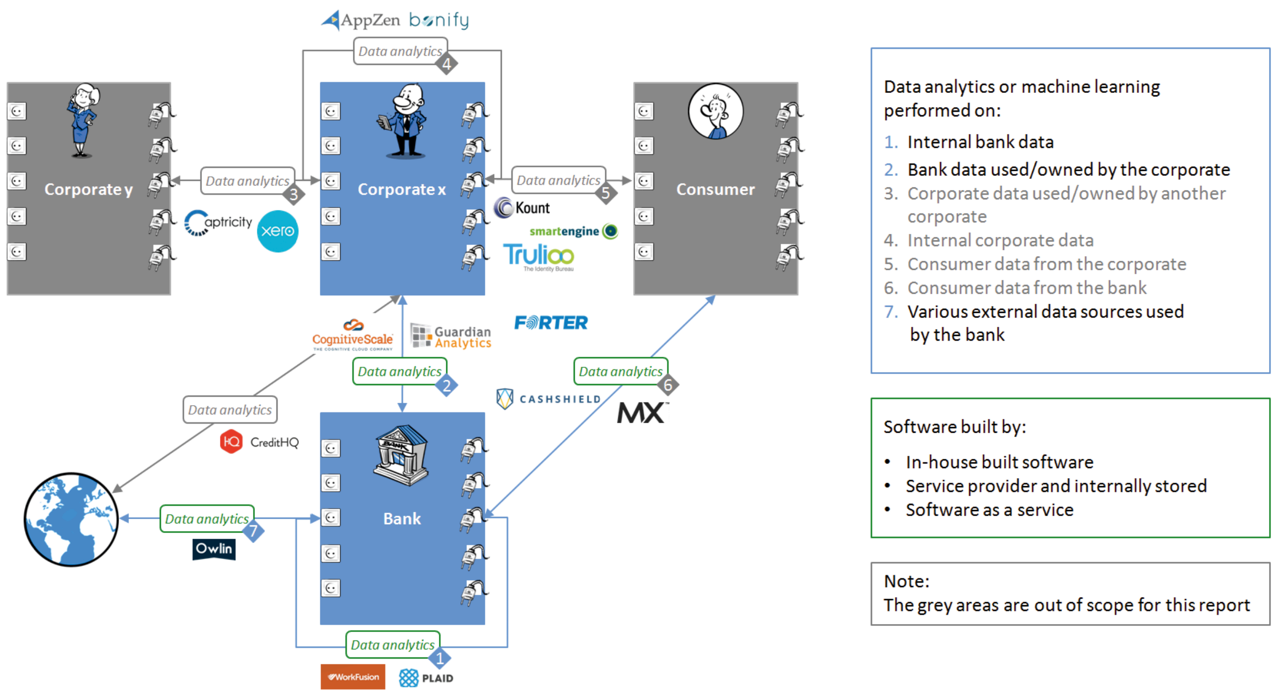

Figure 13: *Areas where data analytics can be performed between banks, corporates and Fintechs* (Source: Innopay)

The following sections discuss several application areas of data analytics within banking.

5.2 Data analytics use cases in banking

Data analytics in banking is still mainly oriented towards supporting internal processes. With today's practices, this means unlocking internal data sources and using analytics primarily to search for operational improvements. Over time, as bank/Fintech collaboration is going to advance alongside the Open Banking movement, we should expect external value creation to become visible, e.g. in the form of banks offering data-driven services towards corporates which, in turn, can improve their (operational and/or commercial) performance. However, it is important to remember that banks operate in the financial area, whereas the data needs of corporates encompass various primary and secondary processes, e.g. manufacturing, CRM, marketing, logistics. From a corporate point of view, banks are just one service provider in an interrelated service ecosystem – but not necessarily in the ecosystem's centre as a 'one-stop-shop' for corporate data needs. As emphasised earlier, if banks want to create differentiated data propositions in an increasingly data-driven economy, new collaboration approaches are inevitable.

The table below lists various (partly overlapping) areas where data analytics can play a role today.

Fraud detection 2 6	*Why*: Payment fraud is on the rise and data analytics is key for keeping up with the pace of new methods to commit fraud being invented. *How*: Using fraud detection methods which constantly learn from new potential fraudulent behaviour and security threats. Continuous learning improves fraud detection by flagging suspicious transactions and recognising fraudulent behaviour. A big challenge is avoiding false positives, i.e. flagging of transactions as fraudulent which are in fact legitimate.
Risk management 2 6	*Why*: Improve risk management. To keep risk as low as possible, gathering and combining various data sources offers a more adequate view of the 'credit worthiness' of specific corporate clients. *How*: By identifying a risk score based on a combination of data sets such as a company's historical data, liquidity and solvency. The underlying trends that can be assessed with (self-learning) algorithms, by combining models from various sources, combining hindsight and foresight data analytics.
Security 2.0 1 2 6 7	*Why*: IT infrastructures are increasingly exposed to external cyber threats. Continuous monitoring of traffic patterns through data analytics is essential to detect anomalies. *How*: Improving security through continuous authentication, adaptive biometrics, and using weak indicators for corporate clients. Comprehensive big data treasury services offer dashboards with a combined view of client limits, legal entities, KYC, financial relationships etc. Facilitate adaptive biometrics (e.g. aging faces, changing voices).

Performance analysis 1 2	*Why*: Decision support for strategic growth. *How*: Combining various external and internal data sources for analysis and prediction of company performance. By doing this in an ongoing fashion, strategies can be monitored in a real-time fashion.
Capital finance management & trade 1 2	*Why*: The process of capital provisioning for trade and general finance, for improvement of issuing, and monitoring corporate credit and automated FX trading. *How*: Complementing the traditional financing process with additional process data sources from corporates (invoices, orders, payments) and external data (economic, social) to optimise use of capital, both for the corporate and the bank.
Customer Service 2 6	*Why*: Improve customer satisfaction to increase new business (cross-/up-selling) and customer retention. *How*: Providing digital assistants to give 24/7 tailored customer service (i.e. a chat bot or virtual assistant).
Sentiment / News Analysis 2 7	*Why*: To get insight about the sentiment of the stock and FX markets. *How*: The stock markets move in response to a myriad of factors. The aim is that machine learning will be able to replicate or even exceed human 'intuition' regarding financial activity by discovering new trends and predictive signals. It is presumed that many future applications of machine learning will be used to understand social media, news trends, and other (unstructured) data sources – not just stock prices and trades.

Table 1: *Data analytics applications in banking*[21]

As described in the table above, there are various application areas within the financial services industry which make use of (transactional) banking data. Currently more and more non-bank entities and technology providers enter these application areas, expecting a positive business case in providing their value-added services. Some of these companies are pure tech providers, for example, they enable banks to offer innovative services, while others are offering a complete service towards corporates without going through the bank (see Figure 14).

[21] The numbers show the position in the value chain, see also Figure 13.

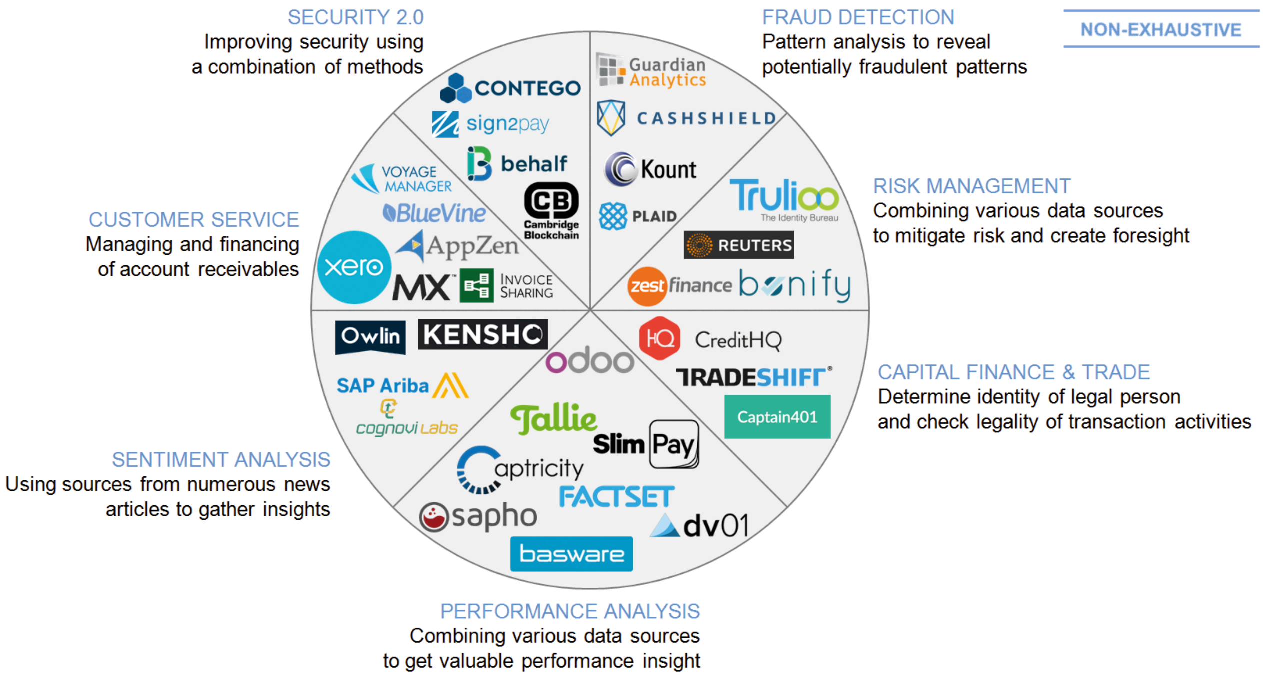

Figure 14: *Indicative overview of data-driven Fintech initiatives* (Source: Innopay) [22]

These initiatives require data from corporates, and in most cases banks as well.

The 'access' layer in the Triple A model is therefore essential for these parties because they need API connections to enable effective data sharing based on proper consent management. Banks wishing to overcome the 'paradox of data analytics' are expected to embrace Open Banking, in order to advance bank/Fintech partnership models. This could allow for differentiated data propositions towards corporates delivered with optimised cost and time-to-market.

5.3 Key take-aways and implications for banks

Data analytics is applied in numerous industries like insurance, logistics, health care, energy, and aviation. In corporate banking, data analytics is gaining ground as an increasingly critical capability for banks to differentiate themselves, improve efficiency and increase revenue growth. In summary, the key take-aways of this chapter include:

- Along the lines of data **availability** and **accessibility**, high value knowledge and actionable insights can be derived from various **data analytics** methods.
- **The paradox of data analytics**: to fully extract the value of the large datasets owned by corporates and banks, some third-party providers offer algorithms to analyse large amounts of data; a precondition for the use of these is that proper consent management is in place.
- **Value creation** from data analytics in the corporate banking domain is mainly ***internally*** oriented and includes application areas such as improved product development, targeted market/sales efforts, operational efficiencies and better risk and fraud management. Analytics also provide a good source of creating potentially priceable service components.

[22] This figure is non-exhaustive and for illustration purposes only.

- **Use cases** can be viewed from an **internal perspective** (fraud detection), **external perspective** (capital finance and trade, customer service or sentiment analysis) or overlapping both internal and external perspectives (e.g. risk management, security 2.0, performance analysis).

- The **increasing number of Fintech start-ups** dealing with data analytics may be an indicator of business potential in this area and initiate a move towards a more data-driven corporate banking landscape.

The resulting key implications that can be derived for banks include:

- **If banks want to create differentiated data propositions that drive external value creation, new collaboration approaches are inevitable.** From a corporate point of view, banks are just one service provider in an interrelated service ecosystem – but not necessarily in the ecosystem's centre as a 'one-stop-shop' for corporate data needs.

- **Corporate data needs go beyond financial data** including other data-driven primary and secondary processes within corporates, e.g. manufacturing, CRM, marketing, logistics. As such, to increase banks' share of wallet in data-driven services beyond the financial and transactional context, new forms of collaboration along the corporate value chain are essential.

- **Fintech collaboration may be a good way of enriching and distributing data services towards corporates.** The ultimate goal is to maximise the value of data analytics and differentiate banks' value proposition towards corporates.

  Strategic positioning of Fintech players in the open banking landscape and along the corporate value chains offers analytics to be performed while overcoming the limitations of data availability and accessibility.

The next chapter will discuss the practical considerations for corporate banks when using data analytics.

6. PRACTICAL CONSIDERATIONS IN EXPLORING DATA OPPORTUNITIES

As described in Chapter 3, technology for data analytics has greatly advanced, offering opportunities for business value in banking and in other sectors as highlighted in Chapter 4 through the various use cases. However, some practical aspects in corporate banking need to be revised to truly reap the benefits of data analytics.

Banks need to develop capabilities in three areas to benefit from data exploration opportunities:

- **Analytics:** develop capabilities to facilitate informed decision making and advice from data.
- **Accessibility:** unlock data sources by being able to both grant access to data to and use data made available by authorised third parties.
- **Availability:** identify relevant internal data and external data sources.

These capabilities need to be supplemented with generic operating model adjustments around and amongst other systems, people and businesses.

Strategic and practical aspects of data analytics

Only when strategic questions have been answered, can the required data be defined. This is the basis for enabling effective data availability and accessibility. Data-driven initiatives and use cases should be assessed based on the 'expected benefits' they generate (e.g. potential value creation, strategic fit and impact on customer experience) and the '*ease of implementation*'. The latter criterion includes availability and accessibility of data, external sources that can be leveraged for data, knowledge and skills, customer's trust and consent to use data, technology and data architecture, and last but not least capabilities to collect, store, analyse and use data.

Then there is the internal versus the external perspective to value creation through data analytics. The internal perspective seeks to optimise the banks' own processes to create value for the bank in the form of improved service delivery towards corporates. The external dimension, in contrast, focuses on 'what data can be offered to corporates as a unique value proposition' and 'how banks can generate new revenue streams from such propositions'. While banks have access to their own internal data, this is mostly not sufficiently unique to allow unlocking specific, actionable insights critical to maximise the value of data analytics and differentiate their value proposition towards corporates. To develop such differentiated propositions, we must realise that corporate data needs in primary and secondary processes go beyond financial information and that (Fintech) partnerships may enable enriching and distributing data services towards corporates.

Interpreting the results of any data analyses poses its own challenges. Conclusions should be interpreted cautiously and with a critical view. The obtained insights are often based on correlations and predictions, such as customers' preferences in relation to certain variables, which may be inaccurate and create false positives or negatives.

Nevertheless, practical aspects need to be addressed when embarking on a data analytics project. The figure below provides a high-level summary of key aspects categorised along the lines of the Triple A model. Three major dimensions of the data operating model are identified where the highest impact is expected:

- **Systems:** includes IT infrastructure and architecture.
- **People:** includes skills of employees and operational processes.
- **Business:** includes monetisation models, partnerships, value proposition and compliance considerations.

NON-EXHAUSTIVE

Strategic questions for data exploration opportunities

1. How does data support the business strategy?

2. Which questions need to be answered?

	Systems	People	Business
Availability	• Choose data from internal/external sources • Consolidate distributed data and data lakes • Define Open Banking/API • standards/formats/processes	• Allocate responsibilities to (new) roles/functions • Hire/train employees with relevant skills (interface designer, API developers, database architecture, data business owner) • Transform organisational culture	• Incentivise customer to share data • Identify relevant internal / external data sources for proposition development • Be aware of compliance / privacy requirements/considerations (PSD2/GDPR)
Accessibility	• Develop developer portal & API catalogues • Implement IT security and access control mechanism ('consent management')	• Design and implement onboarding, approval process for internal and external resources to access data • Define permission for internal and external resources to access data	• Build data governance framework • Select and build partnership model with relevant Fintechs • Be aware of compliance / privacy requirements/considerations (PSD2/GDPR)
Analytics	• Safeguard accuracy of data • Select and implement enabling technologies • Implement procedure to ensure transparancy in insights and decision making	• Hire/train employees with relevant skills (data engineers, scientists) • Develop understanding of insights created	• Consider emerging data protection and privacy developments • Obtain actionable insights for internal and external value creation • Develop marketing & communication strategy • Develop monetisation strategy

Figure 15: *Practical considerations concerning data exploration opportunities and data operating models*

The practical implications of data exploration opportunities and dimensions of the data operating model are subject to the data strategy of the respective organisation.

In summary, the key take-aways of this chapter include:

- **Strategic and practical aspects** of data analytics lead us to two more abstract questions: 1) How does data support the business strategy? 2) Which questions need to be answered?

- **Capability development in data analytics** will start to play a crucial role across the banking sector so that entities can benefit from data analytics.

- Data analytics methods consist of self-learning mechanisms; therefore, **conclusions should always be interpreted with caution**.

- Staying up-to-date **with requirements in technology** (i.e. APIs, data accuracy), **regulation** (i.e. PSD2, GDPR) and **organisational structure** (i.e. skilled developers) might be needed to keep up with the pace of the competition and **staying ahead** using new data-related opportunities.

- Besides availability, accessibility and analytics, there are three other major dimensions to be taken into account: **systems, people and business**, with the highest impact being internal.

The resulting key implications that can be derived for banks include:

- **Banks seeking to become an 'analytics powerhouse' need to ensure effective execution by, for example, organising data and analytics as a centre of excellence (CoE).** The CoE could cut through the internal complexity common at most banks and provide leadership, cohesion, best practices, research, support and/or training for data and analytics initiatives.

- **To make the most of data and analytics initiatives banks need to obtain new skills and capabilities.** Best results are likely to emerge in multifunctional teams of data engineers, data scientists, business intelligence analysts, and project managers all working together in a co-ordinated manner and supported by solid data governance and architecture as part of a next generation operating model.

- **Senior executive support within banks is essential to create a culture where data and analytics are perceived as key to realise strategic objectives and create new opportunities for value creation.** Senior management should make data and analytics an inherent part of strategic planning and positioning and ensure effective communication to all business units and functional layers within the organisation.

- **Banks should perceive their customer's trust as a key asset and proactively manage their privacy.** Indeed, value creation resulting from data and analytics depends heavily on earning customer's trust. As such, those that proactively manage customer privacy will therefore be best positioned. Banks should inform their customers about their data policies, restrict the use of customer data to agreed-upon applications, implement solid consent management solutions (to view and revoke consent) and provide clear and tangible value to the customer.

The next chapter will summarise the previous chapters, incorporating the Triple A model of business value creation in data.

7. CONCLUSION

In the previous chapters, we have seen that data-driven value creation in corporate banking is promising but still nascent. The various Fintech initiatives outside and within banks are evidence of the growing interest for data exploration opportunities in corporate banking. In this chapter, we summarise the key conclusions of this report based on the Triple A model.

The figure below provides a summary of the key considerations that banks should take into account when embarking on data exploration opportunities in corporate banking.

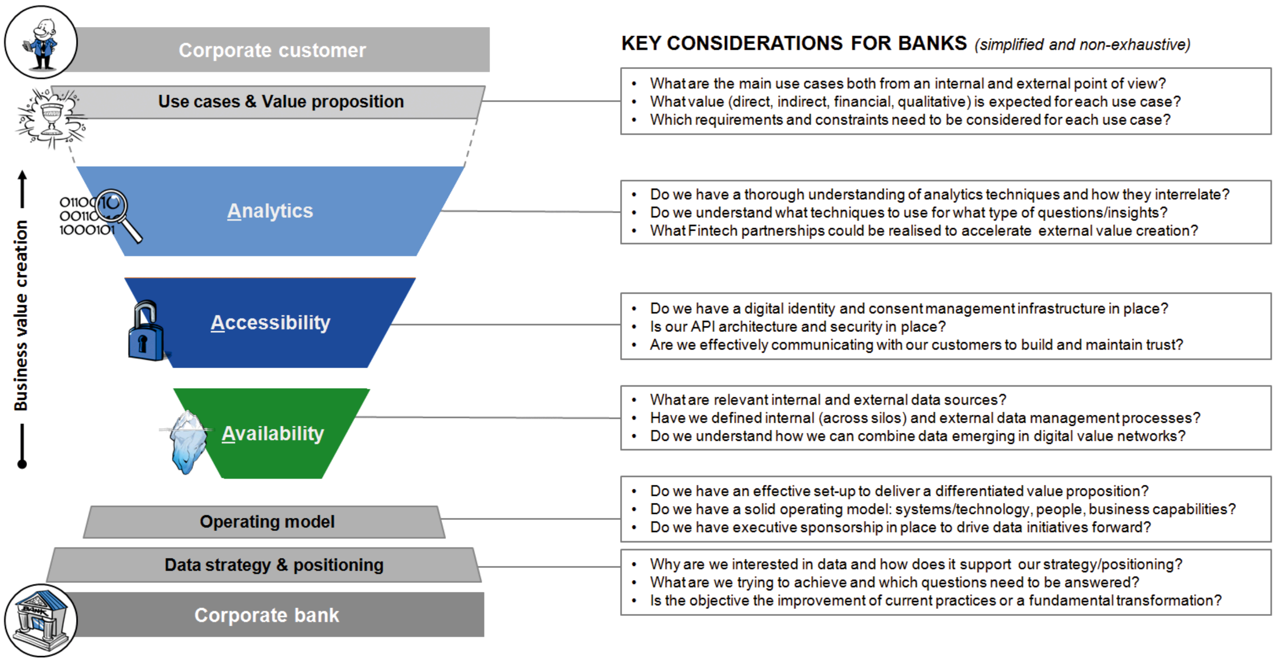

Figure 16: *Key considerations for banks embarking on data exploration opportunities*

Corporate banks pursuing data-driven strategies face several issues potentially impeding the successful execution of their data exploration strategies. The first question to be addressed is the link between data and the bank's strategy: "*which internal and external data is needed to support the strategy and what questions should be asked?*" Other issues to be considered are more operational in nature and may hinder effective data exploration, e.g. relating to skills (data engineers/scientists, compliance), business (monetisation, Fintech collaboration) and IT system capabilities (security, identity infrastructures, service levels).

Use cases and value proposition

Many data-driven use cases and applications to date have focused on an internal perspective, i.e. optimising the banks' own processes to create value for the bank in the form of improved service delivery towards corporates. The external perspective focuses on 'what data can be offered to corporates as a unique value proposition' and 'how banks can generate new revenue streams from such propositions'. This has proven difficult for banks and is still only aspirational for most of them. Banks typically do not own data sufficiently unique (and therefore relevant for corporates) to set them apart or help unlock specific, actionable insights critical to maximise the value of data analytics and differentiate their value proposi-tion towards corporates.

To develop such differentiated propositions, we must realise that corporate data needs go beyond financial information and that (Fintech) partnerships may be a good way of enriching and distributing data services towards corporates.

Data-driven initiatives and use cases should be assessed based on the '*expected benefits*' they generate and their '*ease of implementation*'.

Analytics

Improved data availability and accessibility paves the way for data analytics. When properly executed, analytics allows corporates and banks alike to benefit from actionable insights for timely and informed decision making. Key data analytics application areas include trade facilitation, operational efficiencies and fraud prevention. These are mainly internally oriented. However, analytics also provide a good source of creating potentially priceable service components.

Accessibility

Data is becoming increasingly accessible, driven by technological advancements, a drive for efficiency, and emerging regulatory reforms. PSD2 and GDPR lead the strategic market direction towards open financial infrastructures, commonly known as 'Open Banking'.

Banks seek to open up their infrastructure in a secure way to enable authorised third parties to access financial assets and data of the bank's customer upon receiving the customer's explicit consent ('customer in control'). APIs and digital identity technologies are instrumental to this increasing openness in financial infrastructures, enabling banks and corporates alike to make available and share data through APIs in a secure, compliant and consent-based manner.

This allows these actors to supplement internal data sources with sources from outside their organisational boundaries to create new insights and ultimately new value-added services. Banks should define their strategic position in emerging value networks/ecosystems (strategy, positioning, partnerships) by re-thinking the status quo in 'production' and 'distribution' of corporate banking services, given new data exploration opportunities.

Availability

We have the technology today to turn a traditionally linear supply chain into a 'digitised value network or ecosystem'. Such a value network is characterised by collaboration, integration and openness of internal and external data sources to create next generation corporate banking services.

Data is increasing in volume, as well as in variety and velocity. The number of potential data sources are manifold: internal and external data sources play key roles when assessing data exploration opportunities. Banks should identify relevant data sources that individually and in combination will generate the highest value for their corporate customers.

Operating model

Banks need to develop capabilities in three areas to benefit from data exploration opportunities:

- **Analytics**: develop capabilities to facilitate informed decision making and advice from data.
- **Accessibility**: unlock data sources by being able to both grant access to data to and use data made available by authorised third parties.
- **Availability**: identify relevant internal data and external data sources.

These capabilities need to be supplemented with generic operating model adjustments around and amongst other systems, people and businesses as that is where the highest impact is expected:

- **Systems**: includes IT infrastructure and architecture.
- **People:** includes skills of employees and operational processes.
- **Business**: includes monetisation models, partnerships, value proposition and compliance considerations.

Banks seeking to become an 'analytics powerhouse' need to ensure effective execution by proper allocation of roles and responsibilities regarding data and analytics initiatives. Solid executive sponsorship is a pre-condition for creating a culture that embraces data and analytics as a future source of revenue growth for the bank.

Data strategy and positioning

In order for any data analytics project to be successful, strategic questions need be answered: '*how does data support the business strategy?*' and '*which questions need to be answered?*'. Only then can the required data be defined. This is the basis for enabling effective data availability, accessibility and analytics.

In addition to a solid strategy and positioning, banks should perceive their customer's trust as a key asset and proactively manage their privacy. From a trust and data availability point of view, transaction banks are in a pole position to play a leading role in the data analytics domain, i.e. in the same way that these banks are today trusted with funds, confidential information, and distributing and allocating risk. Banks can play a key role in collecting, protecting, sharing and analysing data securely and efficiently in an increasingly 'open' financial ecosystem.

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