What is digital transformation?

(<https://enterprisersproject.com/what-is-digital-transformation>, <https://www.salesforce.com/in/products/platform/what-is-digital-transformation/#:~:text=Digital%20transformation%20is%20the%20process,changing%20business%20and%20market%20requirements>.)

(<https://www.servicesbytechdata.com/resources/the-4-types-of-digital-transformation-explained>)

In general terms, we define digital transformation as the integration of digital technology into all areas of a business resulting in fundamental changes to how businesses operate and how they deliver value to customers. Beyond that, it's a cultural change that requires organizations to continually challenge the status quo, experiment often, and get comfortable with failure. This sometimes means walking away from long-standing business processes that companies were built upon in favour of relatively new practices that are still being defined.

Digital transformation is the process of using digital technologies to create new — or modify existing — business processes, culture, and customer experiences to meet changing business and market requirements. This reimagining of business in the digital age is digital transformation.

Digital transformation requires rethinking how an organization delivers value. It’s not just about adding technology to existing processes. Rather, it requires a radical rethinking of how an enterprise leverages technology along with operations and people to optimize performance.

Types of Digital Transformation

(<https://www.servicesbytechdata.com/resources/the-4-types-of-digital-transformation-explained>)

(<https://www.chaione.com/blog/4-digital-transformation-types>)

1. Process Transformation

Companies can revise internal processes to lower costs, improve quality and reduce cycle times. Adopting cloud connectivity helps link disparate processes and locations. For example, implementing robotic process automation can transform manual tasks found in procurement, supply chain management and other administrative functions. Modernizing your logistics network and supply chain by digitizing these processes and integrating machine learning and artificial intelligence helps to recognize and shape data patterns into actionable insights.

2. Business Model Transformation

Business model transformation aims to fundamentally change the way companies deliver value for customers. For example, Netflix made the switch from mailing DVDs to online streaming, while Blockbuster failed to make the transition, which ultimately led to the latter company’s eventual fate. Technology OEMs are also switching from a sales and support model to XaaS, where the “X” may be hardware, storage capacity or applications.

Technology companies can reshape their go-to-market strategy and support their customers’ digital transformation efforts with the flexibility to select technology that best suits their needs. Customers often signal their readiness for a different type of relationship through their purchasing patterns.

3. Domain Transformation

Organizations typically adopt new technologies to redefine their products and services. They might extend current services to a new customer base or develop entirely new technology-enabled offerings. For example, offering equipment on a rental basis rather than purchase-only enables you to reach a previously unserved segment of customers who may only need your technology temporarily.

As another example, companies that sell industrial equipment can expand by providing digital solutions to their existing customer base and customers using other equipment. CNH Industrial, a manufacturer of commercial, construction and agricultural equipment, developed its own suite of fleet telematics technology to help owners optimize operation and maintenance processes and connect them with the company’s dealer network for service.

4. Cultural/Organizational Transformation

Embracing a digital-first culture enables organizations to adopt agile workflows, develop a bias toward testing and learning as well as support decentralized decision-making. However, a successful transition to a digital-first culture requires redefining mindsets and processes while also incorporating new talents and capabilities.

A typical mindset shift alters from managing production output to focusing on customer service and innovation. Often, the cultural shift occurs organically during other transformation initiatives as internal teams adopt digital workflows and recognize the power of changing organizational norms.

1. Process Transformation

From data, analytics, APIs, and machine learning to other technologies, much focus within the corporate environment has been on new ways to reinvent business processes to lower costs, improve quality, or reduce cycle times. Examples of successful process transformation include companies like Domino's Pizza, where today customers can order from any device. They've entirely reimagined the food ordering process. This innovation has helped them to overtake their rival Pizza Hut concerning sales.

Other companies have implemented robotic process automation to simplify their back-office processes, including legal and accounting as examples. Process transformation can create tremendous value in a company.

2. Business Model Transformation

Process transformation focuses on finite areas of the business. Business model transformations aim at the foundational building blocks of how value is delivered in a specific industry. In essence, companies are using digital transformation to change traditional business models. Examples of this type of reinvention of the business model include Netflix's redesign of video distribution and Apple's reinvention of music delivery: iTunes.

3. Domain Transformation

A prominent example of how domain transformation works is the online mega-retailer, Amazon. It marched into a new market domain with the launch of Amazon Web Services (AWS) and is currently the largest cloud computing/infrastructure service in a formerly owned field by giants such as IBM and Microsoft. AWS is a clear example of how new technologies redefine products and services, blurring industry boundaries and creating entirely new sets of non-traditional competitors. Domain transformation currently offers one of the most significant opportunities for company growth.

4. Cultural/Organizational Transformation

A redefining of organization mindsets, processes, talent, and capabilities for the digital world is always needed to achieve long-term digital transformation for any industry. The most successful corporations recognize digital transformation requires a flexible workflow, a decentralized decision-making process, a bias toward testing and learning, and a greater reliance on different business ecosystems.

One of the best examples of this cultural/organizational transformation is the consumer credit agency Experian. It was able to change its organization by instilling collaboration and agile development into its workflows. Additionally, it spearheaded a fundamental shift in employee focus from equipment to data throughout the company.

Strategies for digital transformation in finance-

(<https://emtemp.gcom.cloud/ngw/globalassets/en/finance/documents/trends/the-digital-future-finance.pdf>)

([https://www2.deloitte.com/us/en/pages/finance-transformation/articles/finance-digital-transformation-for-cfos.html#](https://www2.deloitte.com/us/en/pages/finance-transformation/articles/finance-digital-transformation-for-cfos.html))

Align digital strategies and business outcomes

Design flexible planning and budgeting

Rethink digital business

Allocate costs to fund digital growth and new business models

Invest in employee performance in a hybrid work environment

Reduce waste and redundancy to free up capacity

Invest in value-driving finance technology

Deploy data and analytics insights securely at scale

Accelerate cloud adoption with right-size, right-choice vendor selections

Hire, retain and develop digital skills in finance

1. The finance factory: Transactions will be touchless as automation and blockchain reach deeper into finance operations.

2. The role of finance: With operations automated, finance will double down on business insights and service. Success is not assured.

3. Finance cycles: Finance goes real time. Periodic reporting will no longer drive operations and decisions—if it ever did.

4. Self-service: Self-service will become the norm. Finance will be uneasy about this.

5. Operating models: New service delivery models will emerge as robots and algorithms join a more diverse finance workforce—think about the integration of freelancers, gig workers, and crowds.

6. Enterprise resource planning: Finance applications and microservices will challenge traditional ERP. Big vendors will be prepared.

7. Data: The proliferation of APIs will drive data standardization, but it won’t be enough. Many companies will still be struggling to clean up their data messes.

8. Workforce & workplace: Employees will be doing new things in new ways, some of which will make CFOs uncomfortable.

Impact of Digital Transformation on the Banking sector and COVID impact-

(<https://iide.co/blog/digital-transformation-banking-sector/#:~:text=Digital%20transformation%20allows%20financial%20institutions,customer%20engagement%20with%20personalized%20offerings>.)

(<https://www.oecd.org/daf/competition/digital-disruption-in-banking-and-its-impact-on-competition-2020.pdf>)

(<https://www.ey.com/en_gl/financial-services-emeia/how-covid-19-has-sped-up-digitization-for-the-banking-sector>)

Digital transformation in the banking sector has fundamentally changed how banks operate and how they service their customers. And as we saw earlier, it’s going to further change and become more and more personalized with time.

Traditional banking systems are for the past now. They consume a significant amount of time and require a lot of manpower. Execution of processes is tedious. This suggests a need for digital transformation to fasten and ease the tasks.

Not to forget how covid-19 has changed the scenario. With lockdowns being imposed and the security of our health getting worse, people have adopted net banking and prefer carrying out every single banking activity at the tip of their fingers.

The solution to this is undoubtedly going towards digitalization.

In fact, the next generations are going to be early adopters of the Internet and are going to be a part of the already digital world. The digital wave that we have experienced in our teens or late 20s, is going to be available to the next generation much in advance.

They are practically going to grow up with it. Thus, to be able to cater to them in the future, the digital transformation of banks needs to start today.

As much as people need banks, it is also vice versa. Private banks are coming up with value-additions year on year, thus to compete with them, it is important that every bank adopts digital transformation.

All these factors suggest that India’s banking sector is set for robust growth. Banks that undertake this transformation can expect reduced costs and streamlined processes.

This integration also helps to provide a more hassle-free and engaging customer experience. There is a severe need to digitally upskill your employees to keep up with this rapidly changing online space.

Now that you have understood the importance and need of digitalization in the banking sector, let’s quickly see the benefits of digital reform.

1. Trustworthiness is gained online

Nowadays, people choose their banks depending on how they perceive the institution. Their perception is shaped by the way a financial institution positions itself online. People are influenced by social media platforms, through websites and advertisements. If banks are able to do some good online marketing, it will help them build trust in people’s eyes.

There are several ways to build a relationship with a customer but there is one particular strategy that has produced great results is Online Reputation Management.

Check this Volkswagen’s Case Study and learn how we helped Volkswagen build and improve its online presence.

Now you may ask that hey this is a case study for an auto sector brand, is it still relevant? The answer is Yes.

Whether it’s Volkswagen or an HDFC bank, they all need to adapt and understand the importance of Online Presence.

2. Acquisition of new customers is cheaper and easier

Banks require customers just as much as customers require banks. Therefore, financial institutions can no longer be passive about the way they attract consumers of financial services. The good news is, there is a cheaper and easier way to attract these customers towards you.

The Internet provides great platforms to reach out directly to these potential consumers, right on their devices. This makes influencing them easier, which in turn leads to an increase in the possibility of them coming to you. It’s also called Content Marketing and is the new word of mouth. It helps to boost engagement and earns trust with both prospects and customers.

3. Personalized Offering

Digital transformation allows financial institutions to know what the people actually want. They can formulate their financial services and offer according to customer requirements rather than guesswork. New innovative technological developments allow banks to strengthen customer engagement with personalized offerings.

4. Enables Innovation & Adaptability

Digital Transformation equips banking institutions to act upon technology and market trends and scale these efforts with gradual successes. Only if an institution is able to upgrade itself, will it be able to cater to the demands of the new-age customers. Sophisticated digital technologies have transformed the traditional way that banking was done.

The emergence of shopping portals, social channels, and integrated mobile apps has opened a lot of doors for banks to reach out to their customers.

Banking institutions need to embrace this new world of digital by moving towards a digital transformation. Here’s an interesting stat; Millennials are more likely to watch a 3 minute Youtube video than read a long pamphlet. That means videos are becoming more and more popular as they are concise and engaging.

Along with videos, there are many other forms of Digital Marketing that brands have started adopting. Here are some digital marketing trends that can be capitalized upon in your plan for Digital Transformation.

Digital disruption in the financial sector is driven by factors both on the supply side, mostly technological developments, and on the demand side, accompanied by changes in consumer expectations of service (Carstens 2018, FSB 2019). On the technological supply side, relevant factors are internet application programming interfaces (APIs),1 cloud computing, smartphones, digital currencies, and blockchain technology.

The use of new technology has important implications for the welfare of market

participants that may lead to lower financial intermediation costs in lending, payment

systems, financial advising, and insurance, along with better products for consumers (see

Philippon 2018, who emphasises that the unit cost of financial intermediation has not gone

down until relatively recently despite technological progress, as well as Vives 2017).

Through online origination technology, FinTech firms offer more convenience to their

borrowers. FinTech drives efficiency in several ways:

1. It can more effectively screen candidate borrowers via statistical models based on

big data, thereby overcoming the information asymmetries that are at the root of

the banking business. Importantly, information may be a substitute for collateral;

therefore, FinTech-based entities may be able to provide loans to firms and

households without posting collateral (often, real estate). Furthermore, FinTech

entities may be able to approve loans immediately, as the Ant Financial MYbank

310 loan application app demonstrates.10 FinTech lenders process mortgage

applications 20% faster than other lenders with no higher defaults and adjust supply

more elastically than do other lenders in response to exogenous mortgage demand

shocks.11 To predict consumer default, easily accessible variables from the digital

footprint (such as accessing a website) are as good or better than the information

content of credit bureau scores (Berg et al. 2018).

2. It reduces the need for personnel (e.g. loan officers and tellers) and for an extended

branch network (since customers use their mobile phones for banking).

3. It allows much more targeted price discrimination. For example, FinTech lenders

employ interest rate–setting models for mortgages with superior performance

compared with those used by non-FinTech institutions, since more of the variation

in prepayment outcomes across borrowers can be attributed to interest rates in the

case of FinTech loans. Furthermore, the convenience of online origination allows

FinTech firms to charge higher rates, especially to low-risk borrowers, who are

more likely to be less price sensitive and more time sensitive. Moreover, refinances

of mortgages are 7% to 10% more likely to originate from FinTech firms compared

with traditional banks (Buchak et al. 2018).

4. FinTech firms can increase financial inclusion by opening the door to financial

services for less developed countries as well as segments of the population12 and

small and medium-sized enterprises (SMEs) currently unserved or underserved by

banks. In particular, many SMEs in developing markets typically cannot fulfil the

requirements for a loan application (e.g., they do not have their accounts audited).

5. Finally, FinTech firms have no legacy technologies to deal with and are

characterised by a culture of efficient operational design, which, along with their

often-smaller size in the case of FinTech firms, allows them higher innovating

capacity than traditional entities.

Cloud computing is another source of efficiency for new entrants. The adoption of cloud

computing by financial incumbents has been slower than in other sectors, which can be

attributed to high transition costs, security concerns, and regulatory compliance

complexities. An advantage emerges for FinTech companies, which can benefit from

designing systems in the cloud from scratch instead of having to work on top of legacy IT

systems.

FinTech firms have changed the structure, provision, and consumption of financial

services, but have not managed to acquire a dominant position in the market. For example,

FinTech firms have not yet made important inroads in corporate lending to medium-large

and large firms. Despite its continuous growth, FinTech credit still represents a small share

of total credit, even in China (where it has the greatest share of total credit activity), where

it accounted for only 3% of total credit outstanding to the nonbank sector in 2017. FinTech

credit tends to be more important in countries with higher income per capita and a less

competitive banking system. Total FinTech credit per capita is high in the United Kingdom,

United States, South Korea, and China. In South Korea and Argentina, BigTech firms

provide a majority of FinTech credit (Claessens et al. 2018, Frost et al. 2019)

The need for different strategies around innovation and digital banking was apparent in banking well before the pandemic hit. As technology has developed, there has been a rise in customer expectations of banking, not least from the instant and personalized services provided by the leading technology firms. FinTechs have shown what is possible and that all banks need a digital plan. For those who are skeptical, since the lockdown we have seen a 72% rise in the use of fintech apps in Europe.

This is a key battleground for banks as they try to convince investors they can incorporate an effective digital path for customers, while also reducing costs and not risking operational resilience. So what has been the impact of COVID-19 on this agenda? It is always dangerous to look at long-term trends or analyze the impact so quickly after such an unprecedented shock. However, even at this stage, we can detect some changes and examine some of the questions raised.

How EY can help

Digital transformation

We combine our deep understanding of financial services’ needs, risk and regulatory challenges with transformative technologies, including —advanced analytics/AI, next-gen data, robotics, cloud, blockchain, cybersecurity and innovation accelerators — to quickly and safely achieve business outcomes.

Read more

Digital revolution to last forever?

The most obvious change has been the swing to effectively online only models. It has been an incredible transformation as banks have moved nearly all their interactions with customers to digital. In a previous article, we discussed how likely it is that consumer behavior changes back once we return to more normal conditions.

They key point was a mere 16% of consumers across Europe expect the way they bank will change over the longer term because of COVID-19. There is a generational gap too. The over 55s are the least likely group to have changed the way they bank, with only 17% expecting to bank more online in the next 1-2 years, while 28% of under 35s do.

If lockdowns continue, then we may see behaviors further embedded but at this stage banks have a dilemma. They are working towards a digital future, and the pandemic has created the environment to demonstrate what is possible. Yet customers have not come on the journey for a more permanent transition and need more persuasion to make digital adoption the norm.

Four key areas for digital success

Many banks had already started including some or all of the below, but COVID-19 has made it clear how key these four areas are to making digital work for customers and banks.

Redefining customer experience: Putting customers and their needs to the forefront to build solutions with staying power. Banks should look at co-creating with customers frequently and often in a proposition lifecycle.

Taking a mobile-first view: From contactless banking to account access, customers expect product and service accessibility from portable devices, at a moment’s notice.

Developing a data strategy for personalization: Building solutions means knowing what data you have, what data you need, what questions you need to ask of that data, and how to interpret the answers. Centralizing existing datasets is key.

Selecting the right technology platforms: When building new services into operations with extensive legacy processes and assets, and subject to high levels of regulatory scrutiny as banking, choosing which platforms to use and how to use them is essential.

For a bank executive today, there are a myriad of issues to tackle. There are economic, operational and regulatory pressures to deal with in the short term. There is also a complicated debate over which technology will be most disruptive or key to change. For example, some believe the cloud offers the biggest opportunity for banks. It offers the sophisticated personalized and real-time services that clients and customers expect where for others AI offers the biggest payoff.

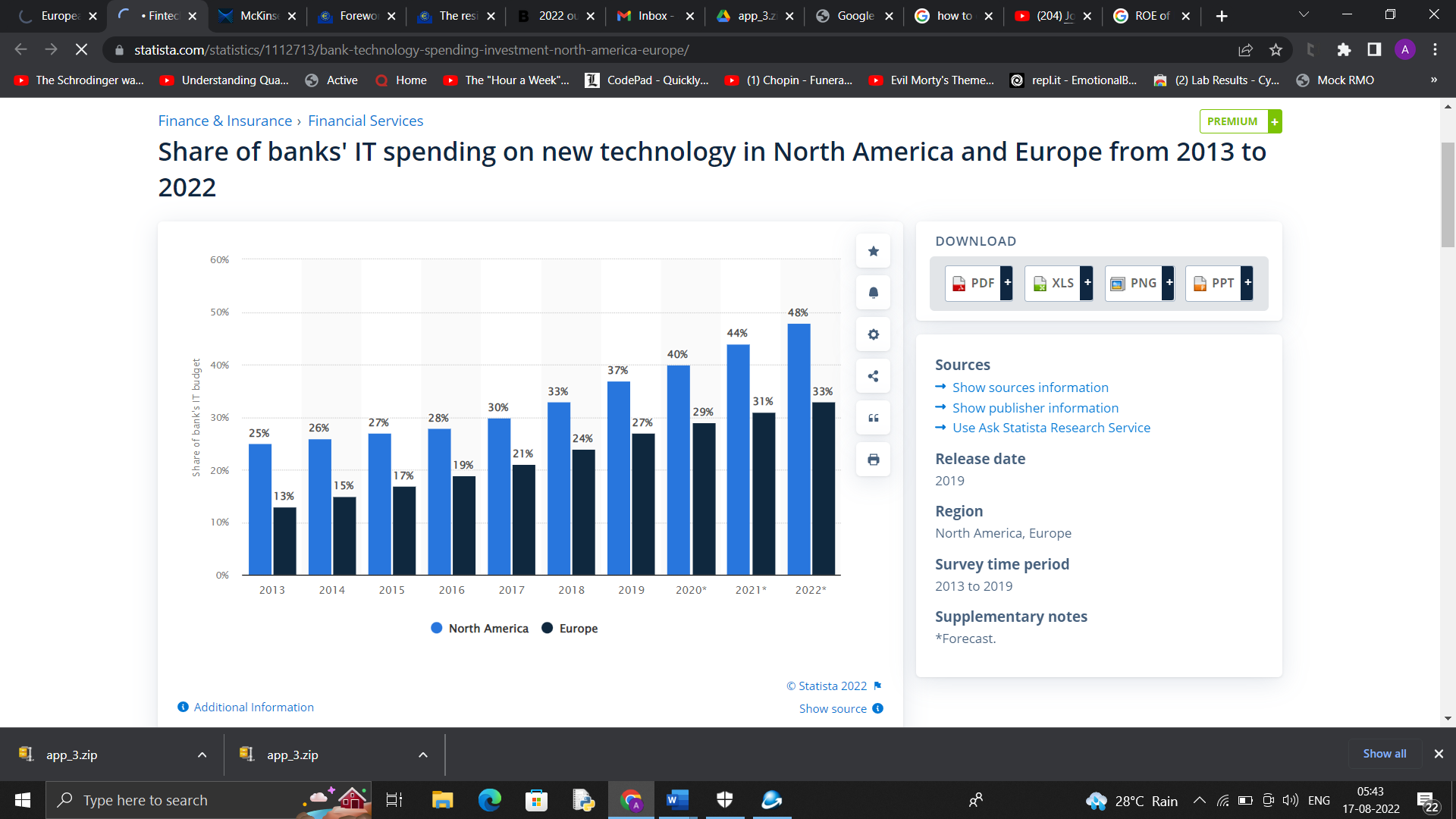
Yet banks have a fantastic opportunity as they have retained the trust of customers and should have the capital to implement the right strategy. Central to success will be advanced technology and a digital ecosystem that takes costs out while delivering better products and customer experiences.

European banks spend on IT from 2018 till 2022-

(<https://www.statista.com/statistics/1112713/bank-technology-spending-investment-north-america-europe/>)

(<https://www.mckinsey.com/industries/financial-services/our-insights/global-banking-annual-review>)

(<https://www.europarl.europa.eu/RegData/etudes/IDAN/2021/689439/IPOL_IDA(2021)689439_EN.pdf>)



On the first, we find that the domicile of a bank explains nearly 70 percent of underlying valuations. Consider the United States, where banks earn nearly ten percentage points more in returns than European banks do, implying starkly different environments.

Banks in Europe and the United Kingdom have $35 billion, or 31 percent, of profits at risk; more severe digital disruption could further cut their profits from $110 billion today to $50 billion in 2020, and slice returns on equity (ROEs) in half to 1 to 2 percent by 2020, even after some mitigation efforts.

WHY IS IT SPENDING IMPORTANT?

Conceptual framework Drawing heavily on Martin-Oliver and Salas-Fumas (2008) and Boot et al. (2021), the importance of IT for banks can be understood using the following conceptual framework. The output of banks includes all activities that provide services consumers are willing to pay for: 1. direct services (such as liquidity provision, payments, asset management, etc.) and 2. services from intermediation (i.e., raising and lending funds). In their role as financial intermediaries, banks focus on overcoming information (moral hazard and adverse selection) and communication (match-making) frictions that can hamper the efficient allocation of resources. To resolve informational frictions, banks screen and monitor risky investments on behalf of savers who lack the capacity to do so. To resolve communication frictions, financial intermediaries invest in the creation and maintenance of customer relationships and product distribution channels. Technological change may increase the value of banks’ services and as a result increase customers’ willingness to pay for them. For instance, by expanding the scope of services that a customer can get from a bank branch, IT capital may facilitate one-stop banking that increases customer value. But technological advances also enable the entry of new competitors. A good case in point is the introduction of internet banking. Drawing on Boot et al. (2021), this may be explained as follows. Historically, banks relied on physical branches to interact with customers. While early technological innovations, such as the automatic teller machine (ATMs), increased convenience for customers and reduced costs for banks, banking largely remained a brick-and-mortar business. The diffusion of internet enabled the adoption of online banking, which brought convenience benefits to customers and increased bank efficiency. However, it also enabled the entry of direct banks that operated without a physical branch network and relied on third-party ATMs.

We downloaded annual reports for 2019 and 2020 of banks being directly supervised by the ECB. Not all banks report their IT spending. Figure 3 shows the number of banks for which we have or do not have data on their IT spending. It is quite remarkable that a large share of banks does not inform their stakeholders on how much they spend on IT (although it is not required to report these data under IFRS). Figure 4 shows the density distributions of the banks for which we have data on their IT spending in 2019 and 2020. We not only scale IT spending by operating income (IT\_OI) as indicator of the spending power, but also by total assets (IT\_TA) as indicator of size and other operating expenses (IT\_GA) as indicator of the relative importance of IT. The distributions in 2019 and 2020 are very similar. As banks do not consistently report their operating income, we have defined it as the sum of interest income, net fee and commission income, income from stock trading, derivatives trading and hedging and gains/losses on capital investments. Most banks report their IT expenditure under operating expenses, but may not do so in a consistent way. In calculating the ratio of IT spending to other operating expenses, we have used the banks’ own classification. The figure offers a snapshot of the situation in two years. As shown by Figure 4, for all ratios there is a large group of banks that are fairly similar (the “bumbs” in the figures), although there are also banks to the left and to the right of these “bumbs”; banks to the left spend less on IT and those to the right spend more.

The main conclusion that follows from Table 1 is that the group of banks that, according to one or more of these criteria, spends relatively little on IT is a very mixed bag. It includes several relatively small banks and also some specialised banks. However, a few large universal banks are also included. In the Netherlands, for instance, a small bank specialised in lending to local government (Nederlandse Waterschapsbank) is in this group, as is the Volksbank, which is the Dutch state-owned banking organization behind ASN Bank, BLG Wonen, RegioBank and SNS. It is much smaller than ING, ABNAMRO and RABO bank. The latter is also in this group, as it has a relatively low IT spending to total assets ratio.

Are banks with relatively low IT spending in the danger zone when it comes to their profitability and the sustainability of their business model in view of new competitors? Not necessarily. The first factor to take into account is a bank’s business model. The more specialised the bank is, the less likely it is to face competitive pressure from fintech disruptors. Likewise, the more universal a bank is, the more likely it is that it will face external competitive pressure and the more important a proper IT strategy will become. That brings us to the second factor: the effectiveness of high IT spending. The experience of Asian banks as reported by Gopoloan et al. (2012) shows that high IT spending is no guarantee for superior performance. Several banks with low IT spending outperformed banks which spent more on IT. This suggests that how IT expenses are used may be more important than the level of IT spending as such. Our data do not allow to examine this issue in more detail.

Finally, IT spending may not only be needed for their potential efficiency and profit enhancing effects, but also for security reasons, like protection against cyberattacks. Whereas underspending by banks on IT in general may not necessarily be problematic, when banks are underspending on IT security measures this is likely to become problematic. Our data do also not allow to examine for which purpose banks spend on IT.

Products Vs Cost spent vs profits - balance sheet analysis

Bank Data Dump

Data Classification and analysis of cost income ratio Vs product vs Cost-

Scatter Plots, what we graph

Data Model for New age bank based on the above analysis-

(<https://analyticsindiamag.com/implications-of-the-new-age-analytics-for-the-banking-sector/>)

The new age analytics model needs to be kept well fed with data and churned perennially for insights across dimensions. The more questions the various teams in a bank ask the analytics model/ tool, the better will be the returns of their analytics investment.

I would like to summarize the entire new age analytics eco-system as below:

The new age customers are generating considerable digital data from within as well outside the bank’s systems. The new age bank needs to take the lead and leverage the new age analytical tools and models to capture, analyze and use it to its advantage.

Analytics team should not work in isolation. They should work closely with alternate channels and product development teams as also with critical departments such as marketing, finance, human resources etc. In fact, analytics team should be well entrenched into customer engagement and product development as well. The more it connects internally, the more efficient it becomes.

Focus on data captured internally within your system such as debit card usage, and then build practical analytics models on top of it to give valuable insights to various teams to enhance revenue and augment brand recall.

Many a times, in an attempt to capture external digital footprint of all your customers, the focus is lost. Instead, the bank should start with a focused set of customers and keep improving their model by increasing the volume of data captured

The bank should pay serious attention to the competitor’s activities on social network. It can provide valuable insights on which the bank should act proactively to create a great brand for itself.

Analytics is not limited to only creating and applying statistical models and waiting for miracles to happen. On the contrary, it’s all about creating a ‘data culture’ within the organization, where every piece of data is respected, aggregated, compared and used to create insights. A successful analytics strategy is all about building a structure, component-by-component and should encompass the following:

Identification of a business area

Identifying and defining a business problem

Identifying data sources (inside & outside)

Data cleaning, mapping and massaging

Building data visualization layer

Building and applying models

Working closely with other stake-holders to convert this data into insights, and in turn, revenue

With the changing times, customer behavior and business process, it’s ideal to move into new age analytics. New age analytics requires the analytics team to work closely alongside marketing, product development and customer teams. They also need to take complete responsibility until the hypothesis is tested and fine-tuned, and results into better customer engagement. The analytics team needs to have in-depth knowledge of the bank’s product development process and capabilities, and needs to work pro-actively to tweak data insights and model hypothesis in real-time to get better results.

Empirical analysis of European/Indian banks based on balance sheets-

Bank Data

Regression algorithm or algorithm to define Cost spent Vs product and result-

Matplotlib, try other than linear regression

Machine learning prediction modelling for digitisation spend Vs profit Vs product ==Final impact on customer-

Sklearn

A qualitative approach questionnaire and conclusion-

What banks spend on is more important, the philosophy of causality, how long it takes for tech spending to take effect, why Europe spends lesser on tech (as lower ROE/profit margins), refer Europa article.