

FINTECHS: THEIR VALUE PROMISES AND DISRUPTIVE POTENTIAL

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***Abstract:** In the last few years technological advancements have occurred at a rapid pace. The financial service sector is experiencing fundamental changes due to technological advancements and digitization. Traditional financial institutions are now facing competition by fintech companies. Fintech companies are filling the gaps left by traditional financial institutions, applying technology and making financial services more efficient, intelligent and customer-oriented. Fintech solutions are also enabling financial inclusion. However, there is ongoing concern regarding regulation and trust of fintech companies.*

In this paper, we will focus on how fintech have and will change the financial service sector. We will provide a better knowledge of the current and future developments of fintech and also consider some critical voices from society.

***Keywords:** Financial technology, Fintech, Financial industry*

Introduction

In past years technology has been developing rapidly. The financial service sector is experiencing radical changes in an increasing pace due to the constantly evolving technologies and digitization. In recent years traditional financial institutions have faced competition by so-called fintech companies (Green, 2017). Fintech is an abbreviation of financial technology, and according to the Oxford English Dictionary (OED), it is defined as ‘Computer programs and other technology used to support or enable banking and financial services. Fintech companies are companies that apply technology to improve financial activities (Marous, 2018). All financial institutions are increasingly starting to rely on technology, but in fintech companies, technology-driven innovation is at the core of the business. The fintech sector comprises Peer-to-Peer lending, crowdfunding platforms, wealth- and asset management platforms, cryptocurrency, mobile payment platforms etc. (Moholkar, 2018).

The use of technology in the financial service sector is not a recent trend. Technology has long been the core of banking innovations, indeed the second half of the 20th century was filled with continued innovation and application of technology in the financial service sector. Already in 1950s credit cards were introduced to the market. The decades after the 1950s saw innovations such as ATMs, electronic stock trading, more sophisticated data, and record-keeping systems and e-commerce, all relying on technology. While all these innovations became widely used, they never threatened the banking sector (Desai, 2015).

After the financial crisis in 2008 traditional financial institutions, such as banks, had to cope with more rigid requirements, and there was no room for innovation. At the same time technology was experiencing an exceptional boom. When banks got back on their feet after the crisis, there was a substantial gap between technologies offered by banks and the rising standards and demands of modern customers (The Future of Things, 2017).

Fintech companies are now filling the gaps left by traditional financial institutions, making financial services more efficient, intelligent and significantly improving the user experience (Green, 2017). They are changing the financial service sector in fundamental ways. The fundamental changes are everything from investment management to raising capital to the very form of currency. Fintech has lowered the barriers to entry and expanded access to financial services (Dong & Min, 2018). Furthermore, fintech is enabling financial inclusion by providing financial services to areas that are underserved by banks and where the local economy is more challenging. With financial inclusion, we refer to individuals and businesses having access to financial products and services, such as bank accounts, loans, and credits (Jagatiani & Lemieux, 2018).

In recent years, there has been an increasing interest in how fintech is going to change the financial service sector. Currently, we are at a point where retail financial services are being further digitized via mobile wallets, robo-advisors, we have equity crowdfunding platforms and online lending platforms. In terms of innovation speed, traditional financial institutions struggle to keep up with fintech companies. This is mainly due to regulatory reasons and the internal structures of banks (Seeburn, 2017). As the services offered by fintech companies are replacing traditional banking services, and banks cannot keep pace in terms of innovation speed, a collaboration between fintech companies and banks might be the best way to tackle this issue (Marous, 2018).

Fintech solutions and technological innovations are now more than ever disrupting the financial world. The changes are relevant for all of us, as they will affect the whole financial service sector. In today's digital age, artificial intelligence, machine learning, and big data are becoming central to fintech solutions (Green, 2017). Blockchain will create new opportunities for innovation and growth in the fintech sector and decrease costs and reduce cyber risks. These changes already are affecting and will in the near future affect all of us (Sharma, 2018).

This paper will focus on the value promises and the disruptive potential of fintech. We will focus on how fintech has and how it will change the financial service sector. The paper will provide a better knowledge of the current and future developments of fintech and also consider some critical voices from society.

The remainder of the work is organized as follows. The next section will provide some insights into current developments in fintech. After that, we will present some real-life applications of current fintech solutions. In section 4, we will present some ongoing research within the field. Further, in section 5, we will consider some critical voices from the society. The final section concludes and discusses the potential future of fintechs.

Current developments

As already stated, fintech is not a brand-new concept, because its history originates back to early credit cards and onwards. However, recent developments and innovations in technology, such as smart computing, artificial intelligence, cloud computing, Big Data etc. have presented remarkable opportunities for fintech's and for new startups in the industry. The modern technologies implemented for the financial industry have remarkably not only cut down the costs of various processes but speed up them as well. Artificial intelligence can in a modern business world execute many different, simple and more complex tasks, leaving more time for the matters that need more human effort, for example understanding human behaviour or culture.

The technologies that are implemented by fintech are simplifying the processes, which leads to time savings and also cost efficiency. Many applications are based on electronically executed payments, minimizing the need for cash or paper invoices. For a variety of companies

this makes their day-to-day activities much easier and faster, but also more reliable when electronic transactions and data can be more securely verified, recorded and stored.

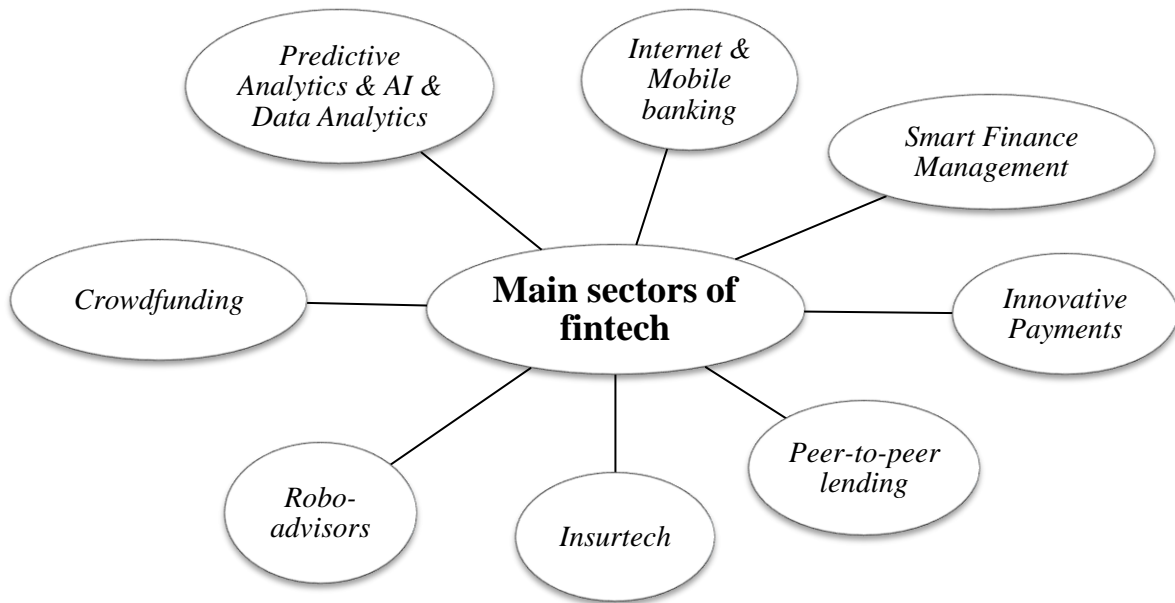
Consumers are also benefiting from these emerging technologies, that are there to make their day to day lives smoother and easier. Applications for mobile banking and mobile cashless payments are implemented to smoothen the processes of paying purchases from stores and peer to peer payment transactions between consumers. Fintech solutions pursuit to simplify and speeding up the process of money movement, whether it is in business to business, business to customer or peer to peer segments.

It is a widely known fact that fintech startups pose a significant threat to traditional banks, because of the simple fact that several fintech innovations deletes the intermediary from the process, in this case, the bank. Banks have noticed the opportunities with the new fintech innovations, and several banks have invested in these new innovations in order to either pursuit future revenue or penetrate new markets with new services (Desai, 2015b). Banks have organized for example, pitching competitions for new startups to present their ideas and innovations, and the banks have then selected the ones that most probably would succeed and invested in those. Why banks are investing in new fintech startups is not only because of the significant threat these startups pose to banks, but because the banks have something important, they can offer for these new startups, that is, trust and reputation. Big traditional banks have a long, possibly several hundred years long, history behind them, and during this time, they have obtained a wide knowledge and expertise over the market and in addition, a vast clientele. These key factors are something the new fintech startups lack. For example, in many cases, when consumer has excess funds they want to invest or they are looking for a mortgage, they turn to banks for these. Therefore, this trust and good reputation is something that the new fintech startups truly need in their early stage operations. In contrary, what fintech startups can offer the banks, is innovation and capability to try new ideas. Because of the long history and complex corporate structure and strict regulations, the traditional banks have restraints concerning new innovations. Several banks have a good reputation they are maintaining, and starting a new endeavor, that might fail, would have a significantly negative effect on that reputation and trust they possess from their clients. By investing in these new fintech startups the banks are combining the strengths of the two, reputation and market insights combined with ability to innovate and try (Desai, 2015b).

Real life applications

In the following chapter we are going to present the main sectors of fintech with the help of examples and real-life applications of these new innovations. The main sectors of fintech that we are going to examine can be seen in the table below.

Table 1: Main sectors of fintech (Source: Authors)



Internet & mobile banking

Modern banking has already for a longer time been relying on internet, and many banks have moved majority of services they provide online. This has led to banks closing down their branch offices, especially in less populated regions. In several situations, where customers need to be in contact with bank personnel, internet banking enables that the meetings are conducted online through a webcam or on the phone and personal identification is being done online, this gives the customers the ability not having to be physically at the bank's office. Several other daily routines have also been moved online, such as paying your bills. Internet banking gives the ability to pay your bills with your computer wherever you are at any given time. E-commerce has also been positively affected from internet banking, when customers can pay their purchases online through their bank directly after ordering their goods online.

Mobile banking refers to the situation where customers use an application on their mobile phone or tablet for conducting transactions in their bank. With mobile banking applications customers can access their bank accounts and conduct transactions for example paying bills or purchases. These applications can also be used for personal identification on internet banking services online. For example, Nordea has an application called Nordea Codes (Finnish *Nordea Tunnusluvut*), which consumer can use for identification and verifying transactions. Several mobile banking applications (e.g. Nordea Mobile) have the opportunity to take a picture of the barcode in the bill with your mobile phone and the application retrieves all information, bank accounts, reference number, amount, due date etc. All that is left for the consumer is to verify the transaction with an application such as the Nordea Codes application.

Smart finance management

The technology used in these applications enables users to more easily have control over their spending and have practical tools to more usefully budget their daily use of money. Applications such as Monzo or Nordea Wallet makes clear graphs of how much the user have spent on food or clothes etc. at a given time. These applications categorize the purchases according to their nature, and according to the specific card the user is using if they have multiple cards. These applications enable Smart Finance Management for consumers in situations where they are able to budget their expenditure easily with the help of graphs and

budget targets etc. and can easily see how much they have on their bank account and on different cards.

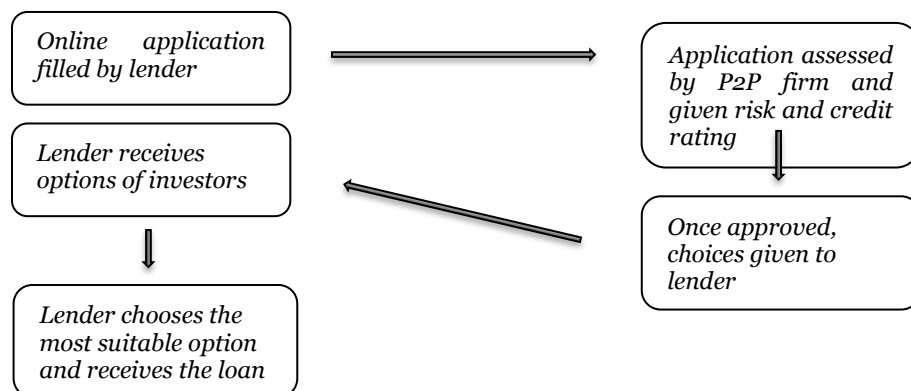
Innovative payments

New innovations in fintech's enable transactions to occur at a much faster pace than before. Applications for innovative payments rely on cashless payments, where consumers can pay their purchases with their smart phones through applications such as Mobile Pay or Apple Pay or Monzo. Mobile Pay enables consumer pay even for other users who also uses the same application. For example, when paying purchases in a shop the customer shows their smart phone near the payment terminal and verifies the transaction. The Monzo app enables users to split their bills, for example when paying a bill in a restaurant, one user can pay the entire bill for the restaurant and add all the other diners who was part of the bill in the application and the application then sends them a payment request to pay back to the person who paid the bill for the restaurant.

Peer to peer lending

FinTech has also made Peer to Peer lending faster and easier. Individuals can easily apply for a loan of smaller amounts without having to go through time consuming process in the bank. Platform called Upstart connects people in need of money with people who are willing to lend money. Lender fills an online application, which is then assessed and given a risk and credit rating and once the application is approved the lender receives options of investors to choose from.

Table 2: Peer to Peer lending process (Source: Authors)



This process is much quicker and easier for the lender, and in addition for the people who are lending the money this form of lending enables a better return for their investment than a traditional bank would give (Upstart 2019). However, with higher returns comes higher risks, there is higher risk of default, that the lender is not able to pay back the original loan. This is a result of the fact that many of the lenders, who tries to find financing from a Peer to Peer lending platform would most probably not receive a loan from a traditional bank.

Insurtech

The insurance industry has also been affected by FinTech's, which has led to a new term Insurtech. Similar to other fintech innovations, insurtech startups pursue to offer their customers better targeted services and products. Personal identification through mobile banking applications enable users to buy insurance policies online, without having to physically visit an insurance company. Technology has carried the insurance industry forward in other ways as well, for instance, a company called Root offers their customers car insurance policies that are being based on how they drive. With the help of telematics, the speed and geographical location and other data of the car is recorded and stored, and the insurance premiums are based on that and not for example an age or gender (Root 2019). In addition, insurtech companies offer insurances for so called "micro-events" for example if a customer wants to borrow their friends' car, they can now buy an insurance for specifically that event. This kind of targeting would be hard or even impossible for bigger traditional insurance companies because of their vast clientele, who they have to be able to serve as larger clusters of customers and not as individuals.

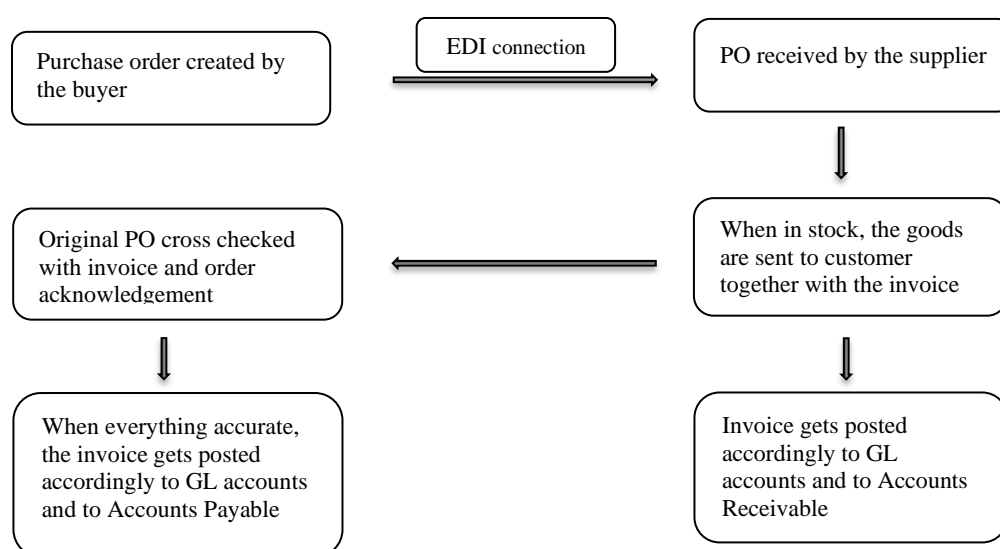
Robo advisory and Artificial Intelligence

Recent advancements in Artificial Intelligence and Data analytics have been a significant leap forward for Fintechs. Modern investment advisory services can provide their customers Robo advisory services. These Robo advisors provide algorithm-based portfolio management, that can fast and cost effective provide the customer with investment advisory and asset management. Further advantages with these are that they are not time or place dependent, while customers use these services wherever and whenever. Robo advisors can be seen fitting between time consuming DIY investing and expensive personal advisory, which means that there is a substantial market for this kind of services. Robo advisory services are also being provided not only for consumers but also for businesses to support the management with their investment decisions. A company called Empirica offers wealth managers an intelligent robo-advisory platform, that uses algorithms and Artificial Intelligence to find the best alternatives and insights about investment alternatives and future market conditions (Empirica 2018).

Business to Business solutions

Simplifying the processes is also the key factor in B2B fintechs. Minimizing paper and speeding up the processes is a significant advantage that is a result of the new technological innovations. E-Invoicing has minimized paper in companies, when invoices gets sent to a platform instead of in paper per mail. For example, company called Basware offer different platform solutions for companies to process their invoices. Some applications even enable automated processing and posting of invoices, without human involvement in the process, which is not only time saving but also cost effective. E-Invoicing together with Electronic Data Interchange (EDI) presents significant opportunities for companies to speed up their processes. For example, EDI-Invoices in SAP gets automatically processed and posted both in the buying and in the selling company, because of the data interchange that enables both parties to know basic information about each other's products, such as product codes, price, measurements etc. The software cross checks the purchase order with the invoice and with the order acknowledgement and when everything is in order and there are not any differences in prices or quantities, the invoice gets posted in correct general ledger accounts automatically and the invoice gets transferred to accounts payable (SAP 2006).

Table 3: Electronic Data Interchange work flow (Source: Authors)



Cloud based Enterprise Resource Planning software, such as SAP HANA, are also making the operations more flexible and effective for many firms. When a company has their ERP in a cloud, they can access it more flexible and the data is more securely stored in possibly several locations. Other key advantages with cloud-based ERP is that this way the company can simplify processes when everything can be done with one single ERP. Furthermore, the cost efficiency is also significant because of the decrease in data management costs (SAP 2018). Fintech offers especially effective solutions for international companies, while enabling Blockchain-based cross-border payment systems that will result in almost instant transactions internationally.

Fintech presents companies also to new forms of financing. Firms or individuals with new endeavors can find financing for their projects through various crowdfunding platforms, such as Kickstarter, Gofundme or Indiegogo. Some of these offer instant withdrawal and around the clock support services.

Big data and Artificial Intelligence

For a while now companies have been able to take advantages of Big Data to improve their operations. With the help of Big Data companies can gather a vast amount of data either from their customers or from the market, in order to pin point customer behavior or market trends and this way fine tune their business to better meet the demands of the customers and the market. In the modern digitalized world, every transaction leaves some sort of digital trail, which means that a lot of data exists of these transactions. With the help of Predictive Analytics and AI this data can effectively be analyzed to explore the behavior of the market or the customers in pursuit of a better position on the market. Several companies have also used Predictive Analytics or AI based applications against money laundering and for fraud detection. This results a more secure and less riskier business landscape for today's companies. For example, client risk profiles are being made much faster and with a much broader perspective than before with the help of AI (Hudson 2018). A significant advantage of this is that the performance is constant and lacks the possibility of human error. Big Data is also useful for investment decisions for especially larger companies, who have the capability to analyze and process the vast amount of data. By using this data managers can make better informed investment decisions (Begen, Farboodi, Veldkamp 2018).

Ongoing research

Fintech is a fast-growing research topic, but as fintech is a new sector, there has not yet been that much research conducted in the field. We are going to examine ongoing research from two perspectives. First, we will present some research that examines the value promise of fintechs and then we are going to present research that examines the risks of fintechs.

Research examining value promises of fintechs

Due to the young age of these new technological innovations that are shaping the modern financial industry in form of fintech, such as cloud computing, AI, data analytics etc., there is not that vast variety of research about the effects they have on the industry. But recent studies have stated that modern fintech will not only change the financial industry remarkably, but it will rather revolutionize the entire financial industry. Paper by Gomber et al. (2018) stated that a remarkable revolution of the financial industry is about to occur due to the great improvements in customer centricity, efficiency and informedness. Furthermore, firms that are not able to keep up with this Fintech Revolution will be having difficult times ahead of them. Gomber et al. (2018) pointed out the vast scale of investments made on Fintech startups. According to statistics retrieved from VentureScanner a total of 1537 startups in 64 different countries received an amount of 80,4 billion US dollars in venture capital funding for their fintech innovation activities. The authors pin pointed three key areas that are the main forces for fintech advancement, and they are: technology innovation, process disruption and services transformation. The advantages created from these factors are significantly simplifying the processes for companies and making the lives of consumers easier.

Another paper studying the advantages of fintech by Vlad Brătășanu (2017) examined the financial industry competitive dynamics drift. The financial services are being changed due to new innovations and technologies that creates products and services for businesses and consumers with the help of data management and digital platforms. The new innovations are characterized by speed, efficiency and client-oriented strategies. The author stated that several services today are being transformed from face-to-face interaction to interaction happening online and possibly even automated. Another key take away from the article is that these technological innovations causes companies demands and challenges to not only keep up with the industry evolution, but also take advantage of these technological innovations and tools in order to better meet the demands of the customers and create customer-centric businesses. Companies with the capabilities to benefit from AI and analytics tools will have a major advantage understanding customer behaviour and creating more thorough client risk profiles and investment decisions.

The study *Do fintech lenders penetrate areas that are underserved by traditional banks* by Julapa Jagatiani and Catharine Lemieux (2018) examine the impact of fintech lending on the availability of unsecured consumer credit. The study investigates whether LendingClub, one of the biggest players in the peer-to-peer lending space, penetrate to potentially underserved areas, where there is less competition in banking services. The findings show that fintech lenders have penetrated areas that could benefit from additional credit supply. In addition, the study indicates that LendingClub had a higher market share in areas where economic variables indicated more challenging environment. Thus, the findings of the paper provide evidence of fintech lenders having a positive impact on underserved areas and areas where the local economy is more challenging. The study does not investigate in potential negative aspects related to fintech lenders, but the authors point out that regulations are needed for financial stability and consumer protection, and the lack of regulations is actually an ongoing concern.

Research examining risks of fintechs

The financial industry can be seen as being constrained by regulations and restrictions resulted due to the financial crisis 2008. These regulations and restrictions have had a decreasing effect on loans and mortgages for consumers. This has presented an opportunity for fintech startups to fill in the gap. An article by Buchak et al. (2018) presents the characteristics of these fintech solutions, shadow banks, that have the capabilities of the banks without their current regulations and restrictions. The authors found that the market share in mortgage origination from shadow banks has nearly doubled from 30% to 50% during the years 2007 to 2015. The paper explains this rapid growth with the increasing regulation of the traditional banking industry and the technical innovations of the new fintech startups. Key finding in the paper is that shadow banks are more likely to serve clients with a higher risk profile, people that have a higher default probability, these customers would not receive a loan from a traditional bank.

The research paper *Evolutionary Approaches and the Construction of Technology-Driven Regulations* by Dong and Min (2018) focus on the regulatory problems regarding fintech companies. Dong and Min (2018) indicate that there is a need for regulatory responses to the inherent risks in technology-driven financial innovations. According to Dong and Min (2018) there are insufficient regulatory techniques, outdated laws and conservative regulatory. The problem is that regulations does not keep pace with technological innovations, as technological innovations develops far faster than applicable regulations. Regulations has failed to meet the demands of fintech companies, hence technology-driven regulations will respond to the risks of fintechs. The paper emphasizes the importance of technology-driven regulations focusing on data monitoring and thus enhancing the financial consumers' rights and interests.

Another article that covers the regulation issue is the research by Hyuan-Sun Ryu (2018). The aim of the study is to provide a better understanding on why people are willing or hesitant to use fintech. To be able to investigate and understand the fintech usage behavior, the users were divided into early adopters and late adopters. The findings show that legal risk was the major reason why people did not have intentions to continue the use of fintech solutions. Convenience was the major reason why people had continuance intention. Legal risk had the strongest significant effect on the fintech continuance intention for early adopters. The study indicates, that the perceived benefit had a much stronger impact on the usage decisions than the perceived risks. The findings also show that users were mainly concerned about regulation and security issues. However, both early adopters and late adopters shared a concern about the lack of consumer protection and operational risk. Thus, the study indicates that fintech companies should improve their reputation by establishing stability and trust.

Critical voices from society

As stated in the previous chapters, technology is strongly influencing the way business is conducted today, and there are some major changes to come in the near future when AI, blockchain and RPA are being further implemented to fintech solutions. However, people tend to resist change to some extent, as people tend to be scared of change. Since today's technological advancements happen exponentially, people have to adjust to changes far faster than before. Hence, the fear of change is even more major in today's society (Dickson, 2018).

Some of the primary critical voices of society concerning the change fintech solutions create, is fear of automatization and therefore uncontrollability. When technology is applied to the financial service sector, the fear of not being able to control things is a growing concern. Today it is almost impossible to understand exactly how advanced technologies work, thus people find it scary to completely rely on automated technology. This creates a sense of losing control over things that were handled manually before. In addition, if a company is too

technology based, it can have major consequences in the event of a system malfunction, further illustrating the concern of losing control (Fritscher, 2018).

There is also a big, ongoing debate regarding trust. Major violations of personal data have increased consumer skepticism when it comes to trusting new technologies and fintech companies. Customers personal data becomes easily accessible and huge amounts of data is collected from customers, even information that might not be needed (Demir & Ramkumar, 2018). However, despite the fact that fintech companies might not be held to the same regulations as traditional banks, they still must follow privacy laws (Ismail, 2018).

Another concern is that jobs in the financial service sector might be lost when artificial intelligence is taking over tasks earlier made by humans. Artificial intelligence will reduce the need of employees, by taking over work that requires analysis, consistent applications of decisions and judgment calls. However, advancements in technology and AI limit the possibility for human error, as tasks previously carried out by humans are automated. Despite the criticism, emerging technologies are also creating new jobs (Fletcher & Kreps, 2017).

Lastly, a crucial concern is the lack of regulations. As fintech companies are not considered as traditional financial institutions, current legalization and regulations does not apply on them, and thus it leaves many fintech companies in a so-called grey area. This increases the concern about data privacy and cybersecurity. Further, regulations fail to keep pace with changes in technology. This often leaves new fintech companies to operate in a so-called grey area. This again results in people being unable to trust fintech companies. Regulations should therefore try to keep pace with the rapidly evolving fintech sector. Legislators are improving current privacy laws and also creating new ones, such as the GDPR, in order to hinder companies from misusing data collected from consumers and customers (Global Banking & finance review, 2018).

Conclusion & Future outlook

Technology is fundamentally changing the financial service sector, and the changes are happening faster than ever before. Fintech has already made financial services more efficient, intelligent and customer-oriented and technology is playing a crucial part in our day-to-day lives. However, as mentioned in the previous chapter some fintech companies operate in a so-called grey area. Even previous research (e.g. Ryu, 2018, Dong & Min, 2018) states that there are some concerns regarding the regulations of fintechs. Regulations are not keeping pace with technological innovations, and this is a major issue. The lack of regulations is a concern that definitely needs to be addressed in the near future.

One way of addressing the concern regarding regulation, is to collaborate with banks. In general, traditional banks have better knowledge of regulations and the banking sector as a whole. A collaboration would also bring other advantages, not only for fintech companies but for banks as well. In addition to the better knowledge of regulations, banks have the benefit of larger customer bases, stronger brands, adequate capital and customers' trust, as they are established and have been on the market for a long time already. Fintech companies in turn, are more efficient, intelligent and better targeting customers. A collaboration between banks and fintech companies would therefore be beneficial for both parties. A collaboration would bring strengths from both banks and fintech companies together and create a stronger entity than either of the parties could be on their own. As stated earlier, banks are already investing in fintech companies, and a deeper collaboration is probably something we will see in the future.

The next decade is likely to see even more financial inclusion. Enabling individuals and companies to successfully manage, save and invest their money will contribute to a better society for all of us (Green, 2017). The findings of the paper by Jagatiani and Lemieux (2018) provide evidence of fintech companies enabling financial inclusion. Fintech is providing access

to financial services for millions of people, who might not normally be able to use financial services (Green, 2017). With a further implementation of blockchain into fintech solutions, it is possible to provide unbanked individuals a valid, easily created online identity, which will allow more individuals to be financially included than ever before. Blockchain will also provide security, thus the data collected will be better secured (Sharma, 2018).

Overall, further implementation of AI and blockchain in fintech solutions can be expected. The improvements we have seen in robots, as well as an improvement in the knowledge about RPA and AI and their potential, will increase the adoption of these in fintech solutions. It is hard to tell what the future holds, but the continuous evolution of technology is inevitable. In what direction this evolution will go can be speculated but not entirely predicted.

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