UNIVERSITY OF LJUBLJANA
SCHOOL OF ECONOMICS AND BUSINESS

MASTER'S THESIS

AN ANALYSIS OF INNOVATION AND DISRUPTIVE BUSINESS MODELS BASED ON FINANCIAL TECHNOLOGY

Ljubljana, May 2020 AMER PIRIJA

AUTHORSHIP STATEMENT

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INTRODUCTION

We live in a world full of changes and many of those changes are driven purely by technology. (Muirí, 2019). The future that is ahead of us keeps unprecedented sights of advancement and intrigue for the inquisitive ones. One assurance that can be seen as an imminence is the steady and continuous march towards technological progress. Young people living in today's world know only of a time of unparalleled exponential technological growth. While we have already seen some of the breakthroughs in innovative technology, a fair share of inventive ones is yet to be seen and explored. Although we do not know what those futuristic inventions will be like, speculative guesses can be made by taking into account what has been already presented to us. (Sharma, 2019) Technology is indeed changing the way we live and work, and has an impact on both individuals and business entities. The interconnectedness of science and technology can help to make our lives easier, only if exploited in the right way (Langridge & Willings, 2019).

In this fast-changing world, where technology and innovation are crucial drivers, it is important to keep up with all those advancements. Due to globalization and high competition, firms find it even harder to stay at the top, than to actually get there (Tredgold, 2019). Being a proactive player in the business, changing the game in the industry, and tailoring it as you like it, requires the blend of innovativeness and artfulness, along with other core business skills in order to be a successful disruptor in the market. The core difference between proactive and reactive business players is in responsiveness to unanticipated events. Proactive players are able to anticipate and exploit opportunities, while reactive players make a move only after the opportunity has already been created and exploited by other players in the industry. Businesses that emphasize proactive strategy are more effective in dealing with challenges. Organizations that use proactive strategies can seize and retain the initiative in competition with other companies (Thompson, 2019).

As we have already noted in the opening discussion of this master's thesis, in order to maintain a thriving business, one needs to be able to spot the right moment when fundamental change is needed and react upon it. Organizations that have proactive innovation strategies usually have very strong research orientation, first-mover advantage, and are ready to implement newest technologies available on the market in their businesses, and eventually become market leaders. Those organizations access knowledge from variety of sources and usually take high risks while making high bets. As an example of those organizations we can list the following: Dupont, Apple and Singapore Airlines (Dodgson et al., 2008).

Successful business model innovations that are based on the disruptive technology have been able to transform entire industries and redistribute billions of dollars of value (Innosight, 2018). As noted previously in our discussion above, in today's fast changing business environment led by various drivers such as globalization, changing customer behavior and

technological advances, opportunities are created for companies but not many are able to successfully exploit those opportunities.

Table 1: Different kinds of industries affected by the emerging technology

Industry Gross Value Added (Billions USD)	AI	IoT	Blockchain	AR & VR
Real Estate ($2,462)	Machine and deep learning are allowing firms to build comprehensive property valuation and suggestion models	IoT connected buildings will provide data/information that can influence the economics and value of commercial real estate transactions	Blockchain based smart contracts can streamline property transactions by removing 3rd parties and enabling self executing actions when conditions are met	VR is allowing builders and agents to create virtual property tours for buyers, some of which are on developments that have not yet even broken ground
Health Care ($1,369)	Cognitive systems are taking clinical notes/reports, patient files, external research/data, etc. and generating potential treatment options for doctors to explore further	Wearable sensors that continuously track vitals and update electronic health records will impact home healthcare by giving doctors the ability to remotely monitor patients	Universal health records can be established by aggregating and placing a persons health history onto a blockchain ledger for any HC provider to access and update	VR is advancing medical education by creating immersive virtual simulations from high risk situations to surgical processes at an anatomical level
Finance & Insurance ($1,355)	AI powered insurance chatbots are able to recreate the experience of messaging with an agent to deliver tailored recommendations	Connected sensors allows insurers to collect enough data to offer individualized rates termed usage based insurance, which adapt to a persons real-world behaviors	Initial coin offerings being used to crowdfund early stage projects in cryptocurrency/blockchain industries by releasing their own tokens in exchange for Bitcoin	Holographic workstations presenting immersive real-time financial visualizations may become a standard tool for traders/analysts
Retail ($1,087)	AI is mastering the art of selling for online retailers by personalizing consumer recommendations based on their digital footprint of behaviors, profile data, etc.	IoT location technologies could enhance retail experiences by sending instant promotions, reviews, or inventories on items as customers move through the aisles	Blockchain will legitimatize transparency of retail supply chains, as raw material and manufacturing sourcing can be recorded to its immutable ledger	AR can enhance the way we shop by displaying and/or filtering info such as, price, promotions, reviews, ratings, etc. to AR devices as customers browse a store
Transport ($503)	Autonomous vehicles will fill our streets over the next decade and bring about packs of driverless long haul trucks called "platoons", which follow a single human driven vehicle through the combination of machine learning and IoT connected sensors		A universally accepted blockchain authenticated ID paired with biometric devices may create a faster and more satisfying experience for travellers	AR is increasing efficiencies in transportation supply chains by creating logistical solutions such as, displaying visuals to aid the warehouse picking process
Pharma & Chemical ($387)	Big Pharma has the potential to test how likely specific combinations of molecules are to make a useful drug by applying machine learning to predict how they will behave	Smart pills (ingestible sensors) are being used to record physiological metrics, spot irregularities, and diagnose illnesses at earlier stages	Blockchain can help combat the $75 billion counterfeit medication market by tracking production, which will build a secure and transparent supply chain ledger	VR is being used to increase worker health and safety within manufacturing environments by recreating simulated emergency experiences such as, chemical spills
Aerospace & Defense ($307)	AI is powering swarms of autonomous micro-drones to advance the stealth tracking and searching capabilities of the defense department	Networks of sensors such as, Lockheed Martin's ALIS, are being embedded on aircraft to detect performance and communicate maintenance needs to ground repair staff; systems like ALIS can use blockchain technology to create a single united ledger that will form a digital copy from every part to mechanic that touches the plane		Troops are being deployed with helmets capable of displaying real-time information through AR, which create advantages in the air and on the battlefield
Utilities & Energy ($288)	Networks of connected sensors throughout appliances and devices can use machine learning to gauge, learn, and anticipate user behaviors and autonomously control a home or buildings energy for optimized consumption, this should ultimately help balance the supply and demand of large-scale energy grids		Cryptocurrencies could reduce disputed energy transactions by quickly processing payments on a transparent ledger with no 3rd party validation required	Experiments using AR headsets to provide field workers with instant information and visuals are currently underway with hopes to improve operational efficiencies

Source: Bird (2017)

One thing worth mentioning in this master's thesis is that the new technologies are indeed creating new industries and at the same time transforming existing ones. Different kinds of industries can indeed strategically exploit various emerging innovative technologies and implement them in their daily business activities as it can be seen in the Table 1 above. (Bird, 2017).

The main purpose of this master's theis will be to address the impact of disruptive innovation on traditional business models with a special attention on the financial services industry. We will be interested in exploring how disruptive innovation at the same time destroys old and creates entirely new industries. As mentioned above, one of the industries on which we are going to put a special focus through our work will be a financial services industry. Mainly, we will be looking at the newly created Fintech industry and the effect of its creation from both company and customer perspective.

The main aim of the master's thesis is to discover the impact of disruptive innovation on a consumer in a financial services industry through various literature, articles, case studies, analysis, websites, reports, and available statistics. The research will be divided into two interconnected parts. First part of the research will purely give a broad theoretical overview of the disruptive business models, technology and its impact on financial services industry. This part of the research will mainly deal with issues from the business perspective. We will be interested in how closely the traditional companies are aware of disruptive innovation and what would be their answer to all those advancements. Second part of the research has a goal to discover what will be the impact of disruptive innovation on a consumer, focusing primarily on financial services industry.

1. BUSINESS MODEL INNOVATION

In the following part of this master thesis we will provide a theoretical framework of business model innovation. This section consists of two interconnected parts. The concept of business model innovation will be explained, followed by an overview of disruptive innovation. Examples of disruptive business models will also be provided. Strategic renewal of organizations concludes this section on business model innovation.

1.1 Theoretical overview of the business model innovation

In its purest form the business model explains how a business entity delivers its products or services on the market. Essentially, the business model relates to the company's value proposition, the target market, how the company accesses that specific audience to deliver its value, and what capabilities it needs to have in its own organization or through partnerships. The business plan also deals with the company's cost structure and from what sources it gets the funds. All of the mentioned components make up a company's business plan (Horowitz, 2019). New business models are most frequently used by start-ups as a modelling tool in order to help them design, prototype and build new business ventures. Not

only are the business models used by start-ups but also by many established companies in order to help them plan, develop and support their innovation activities (Berkemeyer, 2016).

In today's rapidly changing and globalized business environment, the business model reinvention is crucial and can be conducted through utilizing new sources of sustainable competitive advantage that are based on disruptive innovation models emphasizing continuous improvement and not only incremental change (Sven, Marius, Eden, 2003). New, innovative and emerging business models are reshaping roles of the business players in the industries in which they are operating and at the same time establishing some new players on the market. The players with innovative business models are creating an entire new structure on the market and at the same time the old structure gets disrupted and redefined. Existing value chains and industry structures between the old players are broken down and reorganized. Multi-dimensional value webs, in which companies may have multiple roles on the market, are emerging. Existing competitors become collaborators and customers at the same time can become suppliers. New actors are becoming a part of the business ecosystem, which includes social ventures, different types of foundations, public-private partnerships, and sovereign wealth funds. Due to that process, more actors in this specific business ecosystem are able to create and extract value. Assets of players are optimized, since more individuals, and business entities interact and contribute to greater value (Hult news, 2019).

When talking about business model innovation in general we can say that it is a concept that describes conscious transformation of an existing business model with an aim of creating a new innovative business model that is able to create a better value for an organization and its customers than the existing one (Emprechtinger, 2018a). Business executives find it hard to define what business innovation actually entails. Adequate framework for identifying opportunities is crucial in dealing with business model innovation. Without making a proper framework, it is difficult to be systematic. Due to the fact that the process is not done on ad hoc basis, many companies miss out low-cost measures to enhance their profit margins and productivity inside organizations (Girotra & Netessine, 2014).

Coming up with fresh new ideas keeps the business running and at the same time keeps the products and services novel and updated. This high influx of new ideas within the business on a daily basis is known as innovation (Sarkar, 2019). Innovation plays a very important role in any business venture. Unique innovative business model can indeed give competitive advantage to the organization and support its growth process, as many companies hope to drive business growth through creating an exceptional innovative strategy.

These days the financial services industry is being discussed significantly, as it represents the industry which is truly showing signs of transformation, change, and disruption present in almost every sphere of this industry. Here we are talking about the rise of the new and omnipresent industry called specifically the Fintech Industry. Since the trust was broken during the global financial crisis in 2008, the emergence of the so-called technology start-ups in the financial sphere started the disruption in the traditional financial services industry.

These companies were led by the premise that they will be offering and operating with levels of complete trust and high transparency. An interesting observation is that a large number of companies that started creating the Fintech industry were actually technology companies that noticed an opportunity to transform the traditional financial services industry. Those technology companies referred to as Fintechs, by their nature were very agile, now having too many assets and they all possessed one important characteristic and that is they were actually disruptive in their nature. Bringing superior offerings and a new and innovative customer experience was one of the goals of those companies. One interesting fact to note is that those Fintech companies were not only making the customer experience better, but they were also trying to offer products and services that would be able to fill the gaps in current offerings of some well-known and established financial companies. As an example we can use a Fintech company dealing with peer-to-peer lending. Those companies started as a marketplace or an online marketplace with the aim to connect borrowers and lenders transparently. Some of those e-marketplaces or platforms had very innovative features that could even allow borrowers to see where their money was getting used. Using technologies of the new age, Fintech companies were able to deliver extraordinary user experience. We can note that one of the first disruptions in the traditional financial services industry was the introduction of the smartphone, which indeed tilted the balance in favour of Fintech companies. Smartphones having high processing capabilities and using the high data transmission speed made it all possible through 4G networks to take the Fintech wave to the new level. Fintech basically allowed banking to be accessible to anyone, anywhere and anytime. Another important feature that was brought by Fintech companies with the introduction of smartphones, was that they indeed transformed the payment experience, using the newest NFC chip and biometrics software. Fintechs have gone one step further and introduced the pay-per-use insurance using IOT devices, which means that a person can pay for their insurance only while in action.

1.2 Disruptive innovation and disruptive business models

Disruptive innovation is a term that describes an innovation that creates a new marketplace and a value network, and it starts to disrupt the existing marketplaces. Those innovations improve the existing products or services or create new advanced products and services in a way that the market cannot expect (Moore, 2019). In the article published by the Harvard Business Review, Christensen and co-authors Michael Raynor and Rory McDonald wrote that a small company can easily dislodge a well-known, established, and a much bigger rival company, only if it chooses to target specific customer segments of the market that have been rejected or overlooked by the incumbent, since that bigger company is focusing only on more profitable areas. Since the established and larger company focuses mainly on serving and improving products and services for its most demanding customers, the small business can focus on the bottom end of the market, or create an entirely new market that the larger company failed to notice. The smaller company, or a start-up, steps into the market with a new modern and innovative technology that it uses to distribute the products or services that are indeed much more suitable to the incumbent’s overlooked customers, with

one specific difference, and that is the lower price that those consumers are paying. In this specific case, the disruption happens when the customers of the well-established company start buying the products or services from a smaller company (Bailey, 2017).

There are several examples we can mention when discussing disruptive innovation in companies. Currently, Google is in the process of developing autonomous-driving cars. Another example would be Amazon. Amazon is testing their autonomous drones to deliver purchased goods to various locations. Disruptive innovation in such companies is going so far, that eventually we would be able to 3D print our prescribed medication from our homes. Taking into account all those disruptive innovations that we could potentially see in near future, the crucial question for all the companies around the world, no matter in which sector they operate, would be how to respond to such challenges (Bailey, 2017).

Disrupters start by targeting the so-called low-end or unserved consumers and after they have gained traction they slowly move to the mainstream market, as seen on the figure below. Uber went in the opposite direction: it firstly built a position in the mainstream market and after that it slowly started targeting the overlooked segments.

Figure 1: Disruptive innovation

Source: Christensen, Raynor & Macdonald (2015)

While the mantra "disrupt or be disrupted" may frighten many large companies, in essence the true disruptive innovation is surprisingly rare. These days, companies need to be able to respond adequately to disruption, but at the same time the companies should not overreact. Bolstering tight relationships with key consumers by putting their money in sustaining innovations is crucial. Essentially, companies create a new division of their company, a new enterprise whose success depends largely on its separation from the core business. What this

really means in practice is that large companies will be managing two very different operations. As newly created disruptive business grows and gains traction, it may eventually overtake the large portion of customers from the core business (Bailey, 2017).

1.3 Examples of disruptive business models

Innovations in tech and generally any product-service industry can come in various forms and ways. Sometimes it is quite hard to distinguish between ones that Harvard professor Clayton Christensen, characterizes as "disruptive" innovations and ones that are not (Rifkfin, 2020). For an innovation to be considered disruptive, it should exhibit the following characteristics; compared to the incumbents in market, the products and services are simpler, the market that they target is quite smaller and most importantly, they have lower gross margins (Daisyme, 2018). A good example of an innovative business model, that fails to be characterized as a disruptor is indeed Uber. It reinvented and upgraded the regular taxi business model, to the same existing market and did not capitalize on lower margins.

What are indeed good examples of genuine disruptive business models, we can observe by examining companies such as Netflix, Revolut, Airbnb, Spotify, etc. They all fall into various categories of business models that made their product or service stand out.

1.3.1 Subscription model

A model where a company managed to bind its customers to its service or product to a longer period, at a periodic rate which is sometimes more favourable than a lump sum at the beginning. Two companies that use this model, but are also disruptive innovations are Netflix and Amazon.

Netflix

Netflix saw an opportunity lurking in a smaller market segment that hid behind the profitable clients who wish to pay more or in advance to see the newest and trendiest of the movie industry offering. That smaller segment includes movie buffs, who likewise enjoy all the older movies, series and programs, that they had to turn to DVD stores or the cable TV program, to be able to watch or re-watch again (Moore, 2019). A massive shift occurred, when an online video streaming site, such as Netflix, with a small monthly subscription allows you to watch countless movies, on demand whenever and how many times you want. Netflix has thus managed to become the largest video subscription service in the world, with 158 million subscribers in 2019 (Moskowitz, 2019). Netflix was not the only one to pioneer in this online entertainment revolution, companies such as Hulu, HBO and services such as Prime Video (Amazon) are notable mentions.

1.3.2 Freemium model

Freemium, a combination of "free" and "premium" has become a dominant business model option among internet start-ups and app developers, where users are allowed to enjoy a servicer for free and under certain limitations, which are removed if you pay a premium (Kumar, 2014). Besides being one of the most used business models, Freemium is especially applicable and useful for companies that have lower marginal costs due to the business they are in, or where marketing information takes frontline next to operating costs (Talin, 2019).

Spotify

One largely successful innovation that stands against today's I-tunes and traditional record labels, is Spotify, which exactly uses this freemium model (Wessel, 2011). Users enjoy a numerous selection of music for free, whilst having to listen to randomly played advertisements that interrupt the music stream, but provide Spotify with much needed revenues to keep this platform going. Since it legally distributes music and allows musicians to profit from royalties, it is counteracting the illegal downloads and streams online that users have been used to as well (Berkemeyer, 2016). Spotify is also conveniently located, compatible with computers, smartphones and tables, doesn't require an internet connection and works as a radio, when we consider the relative low pricing of premium services (Wessel, 2011).

1.3.3 Sharing economy model

A model highly respected and sought-after business model is the sharing economy model (Talin, 2019). Customers enjoy secure, and tailored services, with possibility of lower prices, where traditional models such as taxi services or hotel services, are disrupted by enabling carpooling or renting of private residences (Miller, 2019).

Airbnb

It is disruptive in a sense that it services a specific and behind the scenes, market segment, which is the traveller who cannot maybe afford a regular hotel room, or hotel rooms are overbooked for normal prices or it does not offer the convenience of a home stay. On one end, and on another, gives a family, group or an individual owner, an opportunity to host their living space and earn profitably, through a secure platform, such as Airbnb. In the beginning it did just that, offer to low-value customers low priced rent possibilities, but eventually, the market grew to include customers that would choose between Hilton and Airbnb's high-quality offering, depending on various other factors and whether is meets a specific need or preference (Bailey, 2017).

1.3.4 Disruptors in banking

An industry, whose traditional ways are highly monumental and respectable, but which sees ever-growing competition from the Fintech's innovations, is traditional banking. It is under fierce competition from start-ups that focus even more on customer experience and needs, by offering tech solutions to costly financial transactional problems (Business magazine, 2018). One of them is surely, Revolut, a European based fin-tech, revolutionising payment, transfer and generally typical banking services.

Revolut

Revolut started off as an alternative to traditional banking, as an app-based service with a multi-currency card. Its founders have been struggling with exchange rate associated fees, or payment fees abroad with various merchants and country-regulations, which they deemed to high coming from traditional lenders who owned and operated the financial industry market (Business magazine, 2018). They introduced the following upgraded services with Revolut; spend money around the globe at the real exchange rate, numerous payments and ATM withdrawals, with standard operations not being over-priced. Possibly the most attractive feature is the multi-currency option, where you transfer money into the desired currency value and spend fee-free where that currency is used, or engage in free international transfers to users also owning a Revolut card, in mere seconds (Wilkinson, 2016). Although their model includes collecting revenue from merchant fees, the profit margins remained low, whilst the user base was slowly growing. Today it is said to have around 4.5 million customers, and also to be the biggest fintech unicorn in Europe (Russon, 2019).

To conclude this section on examples of disruptive business models, we need to say that in order to stay competitive in 21st century, it is no longer sufficient to simply create the new assortment of products and services. Modifying and redesigning the entire business models is crucial for today's environment. Business model innovation indeed creates competitive advantage by providing a more extensive differentiation and higher influence on business's sales and costs figure than just simply product or process innovation (Emprechtinger, 2018b).

1.4 Strategic renewal of organizations

Strategic renewal is another concept that encompasses the dynamic adjustment of existing business model to the external environment. To be able to adjust to the external environment often a radical change in an organization is required. As Gary Hamel stated in the article „Quest for Resillience", strategic renewal is indeed a way of creative reconstruction (Hamel, Välikangas, 2003). This appears to be an urgency in today's fast-transitioning environment when customer needs and market conditions promptly and dramatically change. An insightful phrase about business model innovation, which has been expressed by the company IBM in their advertising campaign, is "Stop selling what you have. Start selling

what they need!" (Gibson, 2018) The worst thing that a company can do is not to listen what the customers really want and at the same time not exploring the ways how to be able to deliver the product or service the customer really wants. Understanding how customers buying priorities are changing and quickly readjusting the business model accordingly to address their new needs is crucial for success these days.

Strategic renewal starts with extensive customer analysis. It is still common that companies, which are deep into the production and manufacturing of their product line, realize that they are serving customers which are no strategic nor important to the company, its goals or profit margin (O. Whitney, 1996). Being able to deduct right customer base, and then create the product they would want to buy, is the reverse process many companies already transitioned too, after noticing their resources, money and time, were wasted and used inefficiently, in the past. In the phrase, strategic renewal, it is implied to commence after a period of evaluation of an existing company state, business model or product line (Binns, Harreld, O'Reilly III & Tushman 2013).

In a Harvard Business Review article "Strategic renewal for business units" by John O. Whitney, the following questions are being asked after the first dissemination of the customer base was conducted:

•Does the customer truly value what we do well or does it require products and services that introduce unnecessary complexity and strain our systems?

• Does the customer provide an opportunity for us to grow?

• Can we learn from the customer, perhaps through its technology, marketing skills, or management techniques?

• Does it provide a springboard to other important customers or customer groups?"

And the second part of the strategic renewal, as suggested, comes through a similar profitability, significance and strategic importance analysis of the products or services offered. By combining the results of these two extensive and somewhat tiresome evaluations, a company can recognize where its future stronghold might lie, constraint to their value proposition, vision and mission (Osing, 2015).

Disruptive business model in the industry means being able to focus on creating, disintermediating, refining, reengineering or optimizing a product/service, role/function/practice, category, market, sector, or industry (Myatt et al., 2018). The key to success in today fast changing environment is the ability to incorporate a disruptive mind-set into all of the business and management practices in order to be able to obtain unique competitive value. Strategic renewal in this context, can be seen as a distinct phenomenon, or a conglomeration of different changes to strategy; be it a discontinuous one or incremental continuing ones, be it a process change or a content change (Whitney, 1996).

2. INNOVATIONS IN FINANCE

Looking back in history, we can state that financial services industry has existed since the beginning of the human civilization. Formed societies were based on principles of mutual trust, honesty, transparency and helping each other either out for a good gesture or for remuneration. Exchanging goods for remuneration in a form of barter mechanism was prevalent in those early days. The barter trade developed through time and newer mechanisms were present. Loans and credits given were in form of providing monetary help to an individual in times of his or her financial distress. Not until 300 BC the first form of currency evolved. Financial services industry in the initial days had a purpose to provide all services associated with monetary transactions. Involvement of multiple intermediaries in conducting financial transactions contributed to the creation of complex financial instruments that we can observe today. People started making profits through financial instruments that were traded, and investment banking and wealth management emerged. During the 18th and 19th century, central banks were formed by countries that would have to act as lenders of last resort. Not going far away in the past, the financial services industry has evolved to something much different than it was before. The trends that we are going to describe in following parts relate to the area of Fintech or Financial Technology.

2.1 The rise of new technologies that are reshaping the financial services industry

The financial services industry experienced its booming phase in 1950s and 1960s, when the ATM (Automated teller machine) and credit cards emerged as means for customers to skip ques in banks in order to withdraw their cash, or to conduct a cashless payment via a promissory card to a shop “on credit”, having received goods or services that you can repay to the bank at the end of next month, rather than immediately. Needless to say, banks decreased their labor costs drastically, and increased the turnover of money with short-term credits to customers eager for shopping splurges, when they want, which doesn’t have to coincide with the exact moment they have disposable income. Technology together with human ingenuity and an eye for what can enhance the customer experience, form an engine that can produce endless future opportunities for Fintech companies. What then was considered as Fintech innovation, today is perfectly taken for granted or known by most of the human population.

What was not anticipated was how fast new technology and customer alignment to new channels of financial service delivery, are going to outpace one innovation after another, making the Fintech industry and start-ups a haven for venture capitalists and more than just an investment strategy for the large financial intermediaries. Fortunly, an online portal for financial news, summarized some key statistics for 2017/2018 that give insight into how much the financial ecosystem has transformed (Fortunly, 2019):

• $111.8 billion of investment globally

• Digital improvements as business priority for more than 80% of banks

• 3 out of 4 consumers use Fintech solutions for money transfer

Maybe the most intriguing statistic that answers the questions of why is there is an interest for businesses to jump on the Fintech wagon, is that 93% of customers prefer technological solutions whenever there is an opportunity and a staggering 89% would share their data with Fintech companies. So, what are the new technologies that reshape the financial industry today? They ultimately affect processes and services such as investment, insurance, lending and asset management (Bassano, 2019a).

2.1.1 Investment

Investment is being affected in an array of ways, by innovations in technology that transform the design and delivery of investment banking services. They refer to Big data, AI and machine learning to analyse investment opportunities, optimize portfolios and offer risk management solutions (Mack & Kissell, n.d.). The areas in need for transformation were financial information management, as well as how the servicing of investor could needs be improved. Particularly, how can we gather large amounts of data, analyse them and create knowledge relevant to an investment company that they can profit from? With an abundance of information available in the internet community, which indeed influence trader's sentiment and the marketplace as a whole, traditional sources of information are no longer sufficient for optimal portfolio analysis; now social media is a source worth exploring, next to security prices or financial statements.

Not only to accumulate, sort and track data, but also considering how large those data sets are, they are using AI to extrapolate trends and get feedback from them, necessary to formulate investment decisions. (Bassano, 2019b) How can we make the investment trading marketplace an ever more liquid and attractive space for customers? An easier access is granted through online applications using computer algorithms (set of instructions that enable the compute to place a trade order), that foster automated trading. Also, how can customers be aided in their investment decisions, minimizing slack time, cost and optimizing their return relative to their exact needs? One answer is robo-advisors; machines that instead of humans, or with their aid, provide the same services, to a larger number of clientele and more efficiently. The other one, is by potentially lowering the use of a third party, between a transaction involving an investor and a company, through the use of distributed ledger technology, or DTL (Quindazzi, 2017). DTL is a wider term for alternate ways of safely storing and conducting financial transactions in a decentralized environment, one prominent example of which is Blockchain technology.

The application of Fintech solutions is truly diverse in the investment sector, from automated trade platforms, wealth management advisors to market sentiment analytics and highly efficient predictive models based on machine learning and availability of big data.

2.1.2 Insurance

The insurance industry is considered by many a non-replenishable source of business that is expected to grow exponentially, as the society continues to invent more and more personal assets, services, processes and situations which are in need for insurance coverage. (Garth, 2019) However, with rising opportunities come also hurdles of adapting the insurance services, product designs and servicing channels to rapidly changing environment and innovations that are being developed by tech companies referred to as "insurtech", as well as incumbent insurance companies (IAIS, 2019).

The areas in need of transformation and improvement include almost every step of the customer experience while purchasing insurance, where added value opportunities arise. From having an online access to a digital insurance platform, with a user-friendly and guided experience of purchase, to having to offer a wider range of customizable insurance products, both by coverage, type and adaptability. One interesting trend is the need for micro insurance, or insurance for very short time periods and small amounts, like one-way flight insurance.

With ease of access, come also the question of optimizing time with effectiveness, by introducing underwriting by a machine, that is AI or so-called smart contracts that "seal" the deal without physical contact. With Big data analytics and machine learning, the risks can be more precisely estimated having access to vast amounts of data. But not only do we just improve the existing processes and nature of insurance coverage and underwriting, but with the emergence of self-driving cars (Tesla) and the "sharing" trend (Airbnb) the traditional role of an insurer has also adapted, as new parties are engaged in the underwriting process. Examples include Tesla, and its offering of life-time insurance for its cars, or BIMA which enables individuals with low income to purchase insurance on a go-to basis using their prepaid phone credit (Deloitte, 2017).

These and many more partnerships arise, as the need for knowledge pooling and gathering expertise emerges, to evaluate new risks arising from disruptive moments in the insurance industry.

2.1.3 Lending

The idea of lending being a service most efficiently offered by traditional sources of funds like banks and other financial intermediaries, began to be concurred by many of the so-called online Market lending places of MPLs. The terms Peer to peer lending, (hereafter: P2P), and Crowdfunding emerged as companies such as Kickstarter or Gofundme, enabled individuals to raise funds from participants in the online community.

Then we have more of an investment arrangement with equity crowdfunding and companies such as Localstake or Wefunder. It constituted of an organised online market where startups gather funds from investors, which in return get equity stakes in those companies. If the

value appreciates or the company manages to have an IPO, inventors get their fair share (Martucci, et al. n.d.).

Sometimes banks need half a month to a month to approve a loan application, while Fintech companies manage to do that under one day (Drechsler). The use of automated processes within loan origination has enabled them to do that, making use of AI and big data. One example is the Baidu (Chinese-based alternative to Google) which invested in Zest finance, a big-data specialised Fintech company, to adapt more efficient credit scoring systems (Deloitte, 2017).

Using new ways to track and measure creditworthiness of their clients, by having access to larger bulks of data online, Fintech's give credit access to customers who would usually be declined by banks because they lack traditional modes of information, like sufficient bank activity. Quicken loan is a noteworthy example, where they evaluate your creditworthiness online, tell you whether you are eligible to apply for loans, check the rates that apply to you etc. (Davis, 2019)

Not only does this increase credit activity and boosts the present purchasing power of individuals, but it also assembles a wide range of investors in one place, that are offered a wider range of investment possibilities according to their risk profile and preferences.

2.1.4 Asset management

A somewhat different case can be argued for asset and wealth management when it comes to disruptive Fintech's parallel development. According to a PWC Global Fintech survey in 2016, financial sector participants have been asked to identify which industry will be most disrupted by Fintech's, placing asset management on the third place. However, the asset and wealth managers don't seem to identify this trend among their strategy priorities in the near future, focusing more on automation and data analytics, where one can mention the use of "robo-advisors". (PWC, 2016)

Why do we anticipate the disruption by Fintechs? Coming mostly from high income individuals, but soon also expanding to middle class societies, the customers want their assets and wealth to be managed in a more digital way, as it's just the usual trend with digitalization and increased use of technology in our daily lives.

To address this Fintech's, identified two priorities for their customers, which are security and customizable solutions. Customers can access their portfolios online using face recognition technology, with more innovations coming soon to the field of identity verification. Also, innovation include accessing your portfolio online continually, tracking of the progress and being able to address a trigger-based portfolio, which significantly lowers the nuances with time differences and office hours. (Finextra, 2019)

3. GENERAL OVERVIEW OF TECHNOLOGIES ENABLING INNOVATIONS IN FINANCE

As the end of 2017 was getting closer, when majority of people were asking questions such as ‘Where you will spend your holidays?’ and ‘What present can I buy grandpa Henry?’, one question seemed to dominate: ‘Do you think Bitcoin is a smart investment?’ Although most of the people at that time didn't know what the Bitcoin actually was, and many still don't understand what the Bitcoin is, it suddenly become something you wouldn't want to miss buying. Taking a small and general example here about the Bitcoin we can see how fast Fintech revolution and disruption is happening these days. In the further text we are going to give an overview of the technologies that enabled these and many more innovations in finance, starting from blockchains, hybrid clouds, AI, machine learning, big data and and many other mentioned in the further text.

3.1 Blockchain

Initially envisioned for cryptocurrencies, as a way of transferring digital currency between parties without the involvement of a middle man, today Blockchain is set out to be one of the next anticipated industry disruptors (Quindazzi, 2017). Two characteristics make it worth exploring by more and more blockchain companies; one is that the transaction costs are zero (not the infrastructure ones) and the other is that it is a decentralized space for data input, transparent and visible to everyone, yet not susceptible to manipulation or alterations, as each added “block” to a chain of blocks, is verified by thousands and millions of computers, and thus is secure and unique in its own way (Rosic, 2016).

Bitcoin applies this monetary concept, but blockchain technology can be used in many other ways too. When talking about the bitcoin, we have to mention that it is an electric currency or cryptocurrency that was created for exchanging electronic form of money through an electronic and highly decentralized system which allows parties to transfer value between each other without knowing one another and with no interference of a third party, or regulator such as bank or government. In the case of bitcoin the value is being exchanged between two parties and no payment has been made between two parties, since only the legal ownership of that value has changed. Today it is possible to send and receive bitcoins easily, by just knowing someone's electronic wallet address. Nowadays Bitcoin stores hundreds of billions of dollars of value on the most powerful computer network that has ever been made. The network is said to be a secured payment system that enables billions of dollars in daily transactions through the network. Taking into consideration Bitcoin's meteoric price rise, it has became an asset class too big to ignore. World's largest investment banks are also monitoring the impact of Bitcoin revolution and the impact on its business. In 2018, Goldman Sachs acquired Poloniex, which is one of the world's leading and largest cryptocurrency exchanges, which indicates that large investment banks such as Goldman Sachs see risks as well as threats in crypto assets. Payment processing and other services could be more and more disrupted in near future due to the emergence of crypto payment

platforms and cryptocurrencies. That represents huge risk for both financial and non-financial institutions since no middleman is required to conduct transactions. The impact that bitcoin is having on culture and economy is said to be extraordinary. For now, blockchain from the aspect of cryptocurrencies, is making customers save time and reduce costs by securely transferring money (Bassano, 2019a).

3.2 Hybrid cloud

Having access to clouds inside a corporation, both private and public ones, is necessary IT architecture that every company's internal process connectivity and data software rely on. The idea is to be able to use the advantages associated with public clouds, such as cost reduction, without exposing vital applications and data, which could be potentially vulnerable when using it.

Hybrid clouds are highly customizable and individualistic and offer businesses the chance to manage the movements of their resources in an effective way between more deployment models at once (Apprenda, n.d.) This gives businesses the necessary flexibility when computing needs and costs change (Rouse, 2019). Allowing for instance the financial sector the keep up with the competition and Fintech disruptions, as the financial ecosystem and demand rapidly change.

According to IBM, the banking sector already is strategizing an optimal bundle of traditional IT infrastructure, together with private and public clouds, which allow them to address security of data, compliance and governance issues (Marous, 2018). More than 40% of the financial services companies plan to move to a hybrid cloud in the near time, according to Nutanix Enterpise Cloud Index (Wojtowicz, 2019).

3.3 AI, Machine learning and Big Data

Artificial intelligence, (hereafter: AI), is not a singular invention or system, it is rather a study on how to teach computers to do things and processes as humans are doing now, and also still better. A variety of disciplines and have emerged from AI studies, such as deep learning and machine learning, which enable these machines in a sense to closer mimic human behaviour (SAS, n.d.) Machine learning is a field of technological studies that is trying to teach machines instead of programming them, while the availability of big data makes that possible.

When talking about the big data, we generally refer to the data which is increasing in quantity, variety through time with an ever-higher speed (Oracle, n.d.) Before, the traditional software used for processing data, was unable to process large amounts of data or to store them before further analysis. When software that could manage that was created, together with the increased use of clouds as storage space, one could think realistically about the benefits that arise from big data analytics when it comes to tackling business problems. It goes beyond simple data analysis, it requires the ones who manage the data to be insightful

and to treat the information in a way that best recognizes patters and predicts behaviour (Kh, 2018). Only then we talk about a useful value proposition. They include having more complete answers due to the abundance of information collected. More variance among data leads to more precise results and thus more confidence.

Answers we extract in the financial service industry are related to the anticipation of demand patterns by customers based on predictive models that big data enables through effective customer segmentation. Segmenting according to customer characteristics and lifestyle and then analysing their online behaviour to enhance financial product packages and make more personalised services, thus increase customer satisfaction (Kh, 2018).

Other uses include optimising maintenance resources by predicting technical failures in machines, making financial investment decisions based on past pattern analysis, detection of fraud, by tracing fraudulent activity on your online banking profile, and if traced, contacting you directly (Oracle, n.d.). Machines are given large samples of data, which they analyse and then make decisions based on their learning process, with little to no human intervention (SAS, n.d.) It cannot prevent risk, but it can mitigate it by predicting or identifying early stages of risky investment behaviour etc.

The applicability of machine learning together that is based on the big data in the finance industry is vast, starting from the facilitation of algorithmic trading, which is now inconceivable manually. According to Techfunnel, around 70% of global trade on daily basis is carried out by machines in 2017 (Bassano, 2019b). Before there was more human involvement while modelling predictions of market changes, compared to now, where those machines anticipate market changes independently and give out results in a shorter time period than before. One special kind of predictive analysis is called sentiment analysis. It tracks human emotions, opinions and attitudes and uses Machine learning algorithms to predict the market sentiment and financial trends (RubyGarage, 2019).

Machine learning together with big data, is also very useful with risk management. More information can be processed and more complete results are included in early-warning systems that alert financial institutions of anomaly behaviour. As well with fraud detection, less verification methods are needed, when the real time use of machine learning is working to detect unusual patterns and online behaviour. This indeed also boosts the customer experience online, with the use of Robot advisors, chatbots and virtual assistants to help with customer feedback and giving them suggestions for potential purchases, as well as reducing labour costs and appealing to more and more tech-savvy generation of customers.

The use of the so called “Robo-advisors”, which are based on the artificial intelligence and machine learning processes, has grown in popularity especially in asset and wealth management industry. When a potential investor, a business person or someone handling their personal finances, opens a webpage of an investment company or fund in search for attractive portfolio options or alike, he/she is going to be quite overwhelmed by all the

offerings and choices, hardly distinguishable to an unprofessional eye. The variety of offerings is just what customers want to have, but there comes the problem of how would they be able to make a good choice, without the assistance of a specialized investment or fund manager? By including more staff and lengthy communication, in a digital and automated area of conducting business, companies started to question to cost-effectiveness of this approach in the long run.

In 2008, some of them introduced robo-advisors as service providers. The clients experience with a robo-advisor starts online with filling up a specialized questionnaire, with categories ranging from general information, spending patterns, to risk tolerance and capacity, as seen in Table 4 below. The software behind the robo-advisor, using algorithms drafted based on historical data from the market, runs his analysis of the investor's inserted data and gives a recommendation. (Friedberg, 2019) Curious clients are more inclined to explore their investment opportunities online as they avoid unnecessary direct contact, which also comes with substantial fees, compared to the fee associated to robo-advisory service provision.

Table 2: Categories and Subcategories for Investors Questionnaire

General information	**Risk tolerance**
Income	Age
Investment amount	Association with Investing
Job description	Association with risk
Other	Choose Portfolio Risk Level
Source of Income	Comfort Investing in Stock
Spendings	Credit Based Investments
Time to Retirement	Dealing with Financial Decisions
Type of Account	Degree of Financial risk Taken
Working status	Education
	Ever Interested in Risky Asset for Thrill
Risk Capacity	Experience of Drop/reaction on Drop/max
Dependence on Withdrawal of Investment	drop before selling
amount	Family and Household Status
Income prediction	Financial Knowledge
Investment Amount/Savings Rate Ratio	Gender
Investment amount/Total capital ratio	Investment Experience
Investment horizon	Investment goal
Liabilities	Investor Type (Self-Assessment Risk
Savings rate	Tolerance)
Total Capital	Preference Return vs. Risk

Source: Michael Tertilt & Peter Scholz (2017)

Wealth management, (hereafter: WM), is dominated by robo-advisors in two segments, the fully Automated Digital WM and the Adviser-Assisted Digital WM (Mack & Kissell, n.d.). Automated Digital WM is fully automated and is used for investment portfolio suggestions,

while the Adviser-Assisted Digital WM is envisioned as a virtual assistant that is there to offer periodic reviews and plan-based recommendations.

In the near future, when robo-advisors become a mainstream service offered by investment companies, the efficacy of their work will be more precisely estimated; do they offer the right recommendations or are they lacking data, that can slip through a systems control, but not maybe during human interaction. Until then, to secure the investors, regulatory agencies have already acted upon this innovation, by demanding that robo-advisors be registered as official investment advisors, in USA, UK, etc. (Mack & Kissell, n.d.)

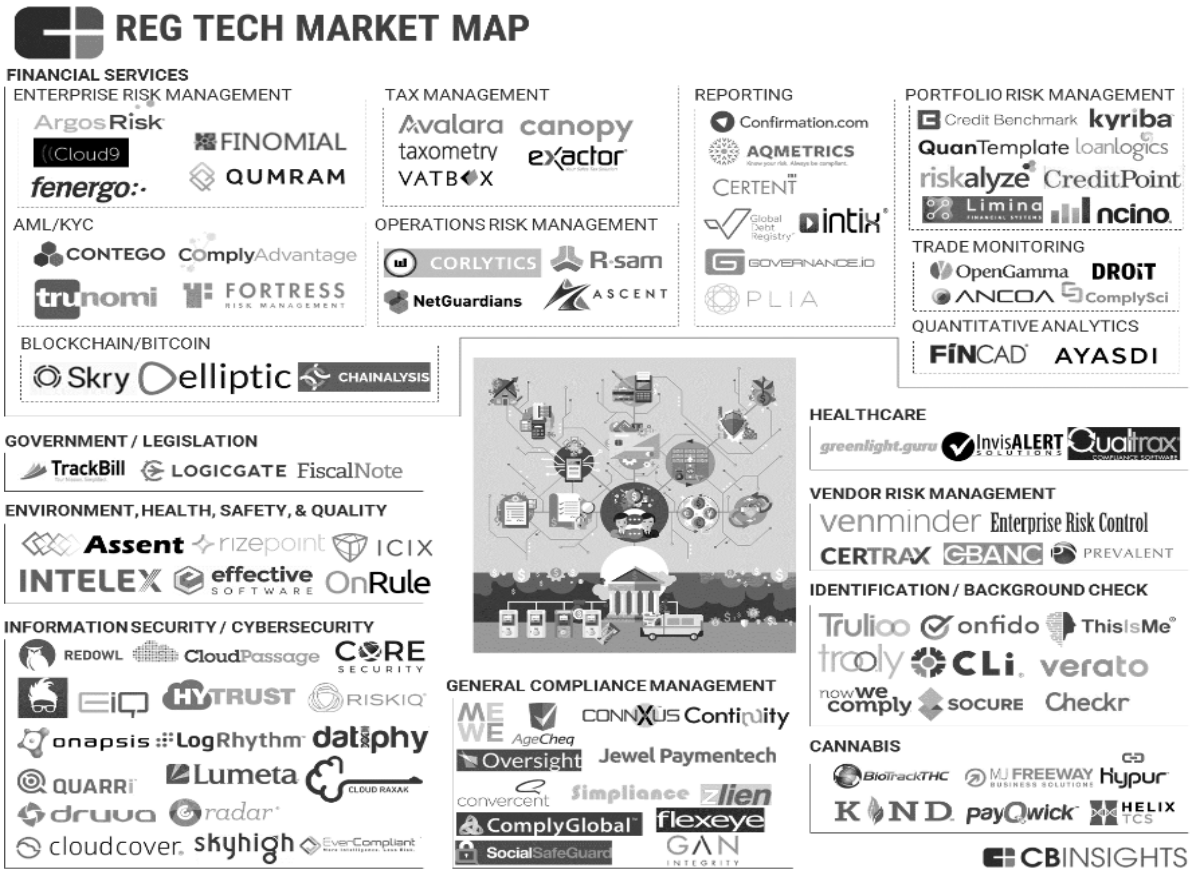
3.4 Regtech

Start-ups with technology innovations, not for the financial sector like Fintech's, but for the compliance and regulatory sector that encompasses all businesses and environments in need of regulation, are now popularly referred to as Regtech's. They offer solutions for Regulatory reporting, Compliance, Risk & Identity Management & Control as well as the monitoring of transactions (Ramos & Laurent, 2019).

Auditing & Regulatory companies, one of them which is Deloitte, is organising challenges for emerging start-ups in the Regtech domain, to provide solutions to regulatory compliance issues with AI and machine learning. In what ways do they answer to these demands? After the 2008 global financial crisis, what was evident was that companies and especially those considered too big to fail, needed even more regulatory frameworks to guide them and keep them compliant. The shift to more regulations was indeed a handful for many corporations, that had to introduce new departments to solely deal with compliance. With that, came also the need for automation and digitalization of processes to ensure continual monitoring of regulatory changes and risks. Regtech's offer specialized software that are able to do that, whilst overseeing vast amounts of transactions and ultimately giving reports as output (Szakiel, 2019).

The need for Regtech solutions, amidst increased regulatory procedures such as ones related to Anti-Money laundering or Know Your Customer (KYC), is amplified by the value proposition they deliver. So far, if a potential fraud case in a transaction is detected by the system, it gives out an alert, and then the department has to go through costly procedures to verify that it was not a false alert. In many instances it is, and it just drains monetary resources, as an investigation into one client can financially burden a company for more than $20,000 and maybe more importantly, it takes up the employee's time (Szakiel, 2019).

Table 3: Reg Tech Market Map



Source: CB Insights Research (2019)

The future of Regtech start-ups is most probably going to be accompanied by substantial influxes of funds and vendor capital, such as with Fintech companies. As seen on the "The Reg Tech Map" infographic above, solutions regtech's provide could be applicable to a wider range of industry sectors, not just in finance.

3.5 Peer to peer lending platforms

P2P is also a new trend, powered by Fintech's. Instead of applying for a loan at a bank, you can go online to one of the available loan platforms that enable P2P lending, and get funding from online investors. If your credit score is good, you can even be surprised by the low rates you can obtain for your loan (Pritchard, 2019).

Central match-making platform, individuals with a deficit in financial means meet those with a surplus ready to invest. Low rates usually possible due to lower overhead costs, compared to banks, as well as origination fees, which are envisioned as an upfront fee based on the size of the loan. (Pritchard, 2019) The greatest advantage, and what attracts most of the participants, is the speed of decision making and application process. Rather than being worried for a longer time period anticipating highly wanted funds, one can know what their

realistic possibilities are in duly time. One still has to go through the necessary applicant screening process, usually through obtaining a FICO score or similar, depending on the platform standardized procedures.

P2P lending companies are also referred to as Market place lenders (MPLs) as they essentially provide an online platform for loan origination and extending. An interesting phenomenon related to MPLs these days, is that they as well as the traditional and investment banks at the beginning of the century, engage in loan securitization (Taylor et al., 2019).

One particular example of the MPL-based company is Mintos; a global market place, that attracts retail investors and gives them opportunities to invest in loans that Mintos extracts from other P2P lending companies. The benefits include among others, a variety of loan types to invest in, where individual investors are ensured to find something suitable for their needs (Mintos, 2019)

P2P lending started off as an alternative solution for applicants in need of cash for personal use purchases, but still not owning a lot of banking activity necessary for them to be evaluated by a depository institution and subsequently being offered low or competitive rates. This idea of shifting the credit-lending function of banks to the open online community is yet to reach its full potential.

3.6 NFC and QR Technology

As online shopping intensifies for customers, or as globalisation increased trade to unprecedented levels, the technology that drives easier and faster transfer of money is experiencing its booming phase. A wider area that includes payments and other related services is digital banking, which precludes having an online account, a digital wallet which you can access through your laptop or smart phone and many interconnected trading/shopping apps and payment platforms that can reach you in a matter of seconds. Technologies leading in the race are QR (quick response) and NFC (near-field) communication.

For a QR payment, you need a camera or scanner to take a photo of the QR code and "read" it, while for the NFC you need a phone with an active NFC, widget that acts as a receiver also with NFC in it and a software as a medium (Tay, 2018). These two options connect your digital wallet, with the physical world of goods and service purchase; in a store when you scan a QR code and conduct a cashless payment, and then open your digital wallet and follow the change in money balance, or you bring your phone close to an NFC reader and it transmits the payment, using for example Applepay. Or with the online world, where your phone has an option to scan a QR code on a webpage and direct you to a payment platform, with Wechatpay or Alipay.

Somewhat different are the companies that use ACH (Automated clearing house) and are payment gateways for automated interbank money movement, such as Paypal, Stripe, Square

etc (Napala, 2019). Depending on the whether one uses them for business purposes or for personal transactions, these three services are differentiated to fit various needs of their customers. While Stripe is an online payment API (Application Programming Interface) custom for B2C e-commerce, Square offers for mostly brick-and-mortar businesses a Point-of-sale (POS) system and together with invoicing and online checkout, the latter of which Paypal also has in its product offering, but is preferable to e-commerce companies for its easy payment features (Shepherd, 2019). What also differentiates them is their cost structure, appealing to their clientele depending on what service they value at what rate.

Alternative ways of payment include also cryptocurrencies, such as Bitcoin, which is widely known in the world, but also with other currencies such as Verge, Ethereum, and Litecoin. Although they are highly risky assets when their price volatility is considered, they are starting to attract many merchant's attention due to their increased popularity among customers as an alternative medium of exchange. Their functionality is backed-up with cryptographic code that secure their identity in the digital world, making them controllable and verifiable. Some of the merchant's accepting Bitcoin include Dell (compute hardware store), eGifter (gift storre), ExpressVPN (virtual private network service), Microsoft, Expedia, Amazon, and 4Chan (online board for posting messages) which accepts all the above-mentioned cryptocurrencies and is thus very attractive to cryptocurrency users (Nowpayments, 2019). One of the main reasons why these currencies are still not in an even wider use, might be due to their risk-associated profile and decentralised environment, but that does exclude digital currency being a means of payment in alternate settings.

China and its PBOC (Central People's Bank of China) are soon going to introduce the first regulated digital currency version of their own local currency the yuan, in an attempt to follow up with the digitalisation of their economy (Bloomberg news, 2019). Even though the Chinese society and businesses is already mostly cashless and used to electronic transfer and means of payment via their mobile phones, this PBOC attempt is necessary to ensure stability of the yuan's value, inside of the country and regulate its outflows, as well as having a base for efficient combating of money laundry and possibly activities which are considered illegal by the government. China is a good example of how a tight regulatory environment, both politically and economically gives space for these endeavours to be fruitful and efficient, while other markets in the world, still have to adjust their intra-country and cross-border regulations to make digital currencies a thriving medium of exchange.

Not only is the medium of exchange being diversified but also the whole payment process ideology. Usually it is based on who provides the service gets the payment immediately, if it's a service without time or geographical constraints, compared to cross-continental trade for example. But two of the world's biggest ride-sharing companies Uber and Didi set an example of how enjoying wide economies of scale and a pool of clients which value their business model and the continual benefits it creates for them, that paying upfront for their service isn't a must (Deloitte, 2017). You can order a Didi cab, without any balance on your digital wallet, have a ride, and check out. You are consenting to the amount the ride costs in

the beginning and the charge is made in the app you use, but it does not withdraw your assets until you approve. The app blocks you from ordering another taxi, if you don't fulfil your obligation. The service is so widely used in China and Australia, that it is currently in further expansion. Uber is an alike example, with a more diversified market outreach.

To conclude with the introduction of how payments, both the means and the process have transformed in the last few years, one has to mention also the benefits of Fintech's such as Transferwise. They provide an alternative solution to banks, when it comes to money transfer abroad, because of their more competitive rates as well as fast delivery (Mittal, 2018). Their expansion and use were prompted by the ease of regulatory environment in the EU, that can be described as having low entry barriers for such a service, due to it being an economic union, where financial capital is free to move among more than 20 business-diversified countries.

3.7 Ethereum and Smart Contracts

Ethereum is an open software platform that is established on blockchain technology that allows developers to create and deploy decentralized applications. The platform also runs smart contracts which are applications that are being run without any interruptions, downtime, censorship, fraud or third party interference.

As explained before, blockchain is administered by a network of computers that verify transactions that run through the software. This gives benefits necessary to consider why Smart contracts could be the new disruptive moment in the financial sector industry. A smart contract would be made up of compute code, activated when certain conditions are met, stored safely in a public space and non-changeable and they are transferred from one party to another without a middle-man (BitDegree, 2020).

How are smart contracts applied today or will be applied in the future? An example in the insurance industry might look like this; a customer of flight insurance gets into a smart contract with an insurance company. They both top up their share of the money into the system, the customer the insurance premium and the insurance company the amount it will have to disburse, in case the insured case happens (flight delay) (Bitdegree, 2020). The smart contract will be triggered in favour of the customer, if the flight is delayed, digital money is transferred to the customer's account, and if not, then to the insurance companies.

Without the involvement of a third party to audit and control the parties and their respective contractual obligations. And many more uses could be identified, from health systems and having smart contracts protecting patient data from third-parties, to governments enacting a transparent and secure voting system, safe from fraud.

The potential that smart contract will hardly show limits in the near future. From regular small two-party agreements to governments and corporations, smart contracts create opportunities for automated and efficient transaction processes (Pratap, 2018). They are still

in the development phase, until the issues with cybersecurity are fully excluded and in need of continual updates to ensure the value proposition remains stable.

The applications run on Ethereum blockchain can move value around the users of the platform. Ethereum developers are able to create markets, store registries of debts or promises, move funds as required, and that is all possible withoud any middleman interaciton. When comparing Bitcoin to the Ethereum we can note that significant differences exist between those two. The most important distinction to emphasize is that Bitcoin and Ethereum differ substantially in purpose and capability. Bitcoin offers one specific application of blockchain technology and that is a peer to peer electronic cash system that enables online Bitcoin payments. Bitcoin blockchain is also able to track ownership of digital currency (bitcoins), while the Ethereum blockchain focuses on running the programming code of any decentralized application. Compared to Bitcoin, In the Ethereum blockchain, users of platform instead of mining for bitcoin, users work to earn Ether, which is a type of crypto token that is fueling the entire Ethereum network. Ethereum is also tradeable cryptocurrency and is used by application developers to pay for transaction fees and services on the Ethereum network (Rosic, 2018).

4. THE EVOLUTION OF FINTECH

Financial technology is a reference for financial solutions prompted by innovations in technology (Aldoma, 2019). Even though the portmanteau is newly coined, the idea behind financial technology is quite older than we might assume. Before technological innovations of today were even possible to imagine, there had to be some preceding financial globalisation and infrastructure in place.

As defined by the Fintech 1.0 era on the infographic below, the world of finance began to get better linkages and connections through inventions such as the transatlantic cable in the 19th century and the Fedwire, CC's and Diner's club in the 20th century (Arner, Janos, Ross, 2016). Fintech then gradually expanded to the financial intermediaries to digitalize and automate their services. The banking institutions benefited from the introduction of ATM (Automated Teller Machines), the Investment companies from an electronic stock exchange NASDAQ, businesses from e-commerce and SWIFT, which allowed for large cross-border money transfers, and many more inventions which are under the belt of Fintech 2.0.

What did the near past bring to us when we talk about Fintech 3.0 and the future Fintech 3.5 (Arner, Janos & Ross, 2016) As technological progress and development enabled more consumers to partake in personalized inventions, which are exponentially less costly to manufacture and purchase, so did the numerous start-ups emerge to satisfy niches of customers, in this instance Fintech's. Solutions varied from digital wallets as Google Wallet, QR payments with Wechatpay, Bitcoin, to all possibly imaginable uses of AI, Blockchain, Robo-advisors etc. (Aldoma, 2019).

As we witness upward trends for technological advancements, new Fintech's, new solutions, so does the competition among traditional financial institutions and start-ups increase. A favorable outcome would be to instill partnerships and work jointly on creating the best solutions using financial technology.

Table 4: Fintech Evolution

Source: Zigurat (n.d.)

4.1 The role of traditional banks and other financial intermediaries in Fintech environment

The Fintech environment is a produce of all technological advancements that were able to be successfully implemented in the financial setting, through service-provision of various kinds aimed to serve a rapidly evolving customer base. Those technologies are mostly ingenious ideas of Fintech start-ups that were able to identify a bottle-neck or a process in need of further digitalization and improvement in the financial sector (Olechowski, 2019). And just like that, they are able to step in to the role of a traditional bank or a financial institution and offer a service in a cheaper, more efficient and more customer-oriented way (Financial brand, 2019). Needless to say, the competition among providers of financial services is intensifying exponentially and the race to secure market segments and customer loyalty was never so acutely present.

One assertion that could be made after observing the Fintech disruptive industry and the traditional banks and other financial intermediaries trying to follow up, is that a mutual collaboration between them would be highly advisable in order to drive forward. Fintech's companies offer unique solutions, but the incumbents in the industry have access to vast markets and enjoy economies of scale (Shevlin, 2019a). For banks, such partnerships with Fintech's would give them access to technology, which they can quickly align with their strategy and business model, and achieve the desired digital transformation.

But there is scepticism from both sides. Fintech's cultivate all a unique corporate culture, which in many ways is more similar among them, than with large financial institutions such as banks. The clash of corporate cultures may result in misunderstandings and not mutually satisfying collaborations (Shelvin, 2019b) The size difference, missions and vision may

somewhat pose an entry barrier to one on one partnerships; however different modes of knowledge pooling may be coming to the forefront. Other forms of connections are platforms such as Megabank API toolkits, trade places (Amazon), platforms for analytics, business creating platforms and core integration platforms (Shelvin, 2019a). Then we have the concept of open banking; even though third parties do not have partnerships per say with banks, by having customers consent on sharing their banking data with third parties, a connection is nonetheless formed.

Even though they are regarded as exceptions, some notable partnerships still were formed and are flourishing such as MCB (Metropolitan Commercial Bank) with Revolut, TD Bank with Hydrogen, Axons bank with N26, HSBC and Identitii and many more (Suarez, 2019). To better understand why there is a gap between this potential partner mix, a survey was conducted by Bank Innovation and INV Fintech, called the "2019 State of Banking Innovation Survey", which revealed how is an underlying and widespread misunderstanding of challenges on both sides. While the Fintech's undermine the importance of security risk that Financial institutions highly monitor, the latter don't identify the corporate culture misalignment as a hurdle (Suarez, 2019). Both sides identified issues of compliance with regulation as a potential hurdle.

There is no doubt, that the horizon for exponential growth in technological advancements applicable in the finance medium, is going to shape itself and go at a speed which these Fintech's together with other financial intermediaries dictate. Connections and collaboration in various ways will foster this growth pattern, but it is essentially up to individual examples of such partnerships, and their approach to sharing resources and knowledge, that will determine the success rate.

4.2 Reaction of the traditional banking industry to the latest Fintech trends

Traditional banking today may refer to brick and mortar facilities, offering usual banking services; being depository and credit-giving institutions, highly regulated and presumably offering a set range of products that apply for the widest segments of consumers (Garn et.al 1985). As consumer behaviour or financial/regulatory environment change, so does the banks reaction and adaptation process start anew. With the 21st century, came also a rapid development of technologies soothed for the financial sector, a transformation of the financial market assets into a machine of high risk/high return derivatives, and the exponential growth of financial intermediaries that pose a competitive threat to the survival of traditional banking corporations.

The growth was prompted by a changing the mindset of consumers, most notably millennials, aged now between 20 and 40, which are characterized as highly individualistic, tech-savvy, search for authentic value propositions, personalized marketing, like to engage with the brands preferably through social media and through loyalty programs. Additionally,

what makes them profitable is the size of this age group together with their shopping habits, which could be considered also impulsive (Vantage, 2017).

How banking institutions react today to these changes in such a competitive environment? A substantial focus is placed on improving customer service, as traditional bank opening hours cause frustration among customers, now with apps and virtual assistants, a 24/7 real time accessibility is ensured (Sharma, 2018). Even when visiting branches, the situation customers want to avoid is the queuing up in lines or taking a ticket and waiting in the hallway for unknown time periods. Now automated machines have replaced human interaction when wanting to conduct basic money operations; taking out cash, topping up your bank account, paying bills. In a banking report by Accenture, clients of banks are welcoming of computer-based support by a margin of 71%, as long as they are custom-tailored to the individual's personal needs (Accenture, 2017)

AI and chatbots service the need for speedy, real time answers and help, boost customer brand perception and loyalty additionally, as the added value service, makes the banks stand out (Marous, 2018). With digital banking, many services have been transferred online, from loan applications to various other fill-in format type of requests, that can be time consuming and confusing, leading customers to abandon the process half-way or lose interest.

Co-browsing is a safe technology, with which online assistants guide the customer through the online steps with pre-authorization of course, and deliver a unique digital experience, with a higher turnover of positive outcomes (Bassano, 2019a). With the inclusion of message, email and chat assisted help, information and marketing, they seem to lack a personalized approach, being widely considered as automated and generic. Consumers want contextual replies and suggestions, which demand a higher level of sophistication on the side of technology with which the bank operates (Vantage, 2017).

What was mostly anticipated was the quick jump from core digital banking to self-service banking. It is not enough to be able to see your bank balance through an app, access it with your finger print ID, pay contactless; now almost any service from money transfer abroad, to accessing digital currencies, is expected to be on demand for a consumer, without the need to contact an agent, or actually visit a branch (Fintech news, 2019).

4.3 Fusion of Fintech and banking

Big data stored and generated through banking channels is said to grow each second by 700% by 2020 (Fintech news, 2019). What do the data analytics provide for banks and then subsequently for their customers? Marketing products and offers can be optimized through real time observing of client's online bank accounts and activity, due to better customer segmentation and customer feedback analysis. The optimized operations performed online by clients, will ensure for an improved experience as well maximized effectiveness and efficiency of product and service placing.

Proactive fraud prevention, digital wallet, online service up to speed and capacity, security updates in real-time and fast, without disturbing the customer, reach geographical areas with no branches, establish presence through digital banking and a stable wireless connection (Legters, 2019). An example of how these changes are being implemented by banks but also might include a negative side effect for employees, is the Deutsche bank AG five-year restructuring plan (Arons, 2019). It foresees how Machine learning and AI, can process and evaluate more data and compliance testing than employees, ensuring a better cost-effectiveness in the future.

4.4 How Fintech is changing the investment profession

As we have already mentioned in our previous discussion, new technologies indeed promote new business models and disruption and creative destruction of traditional business models are endemic.

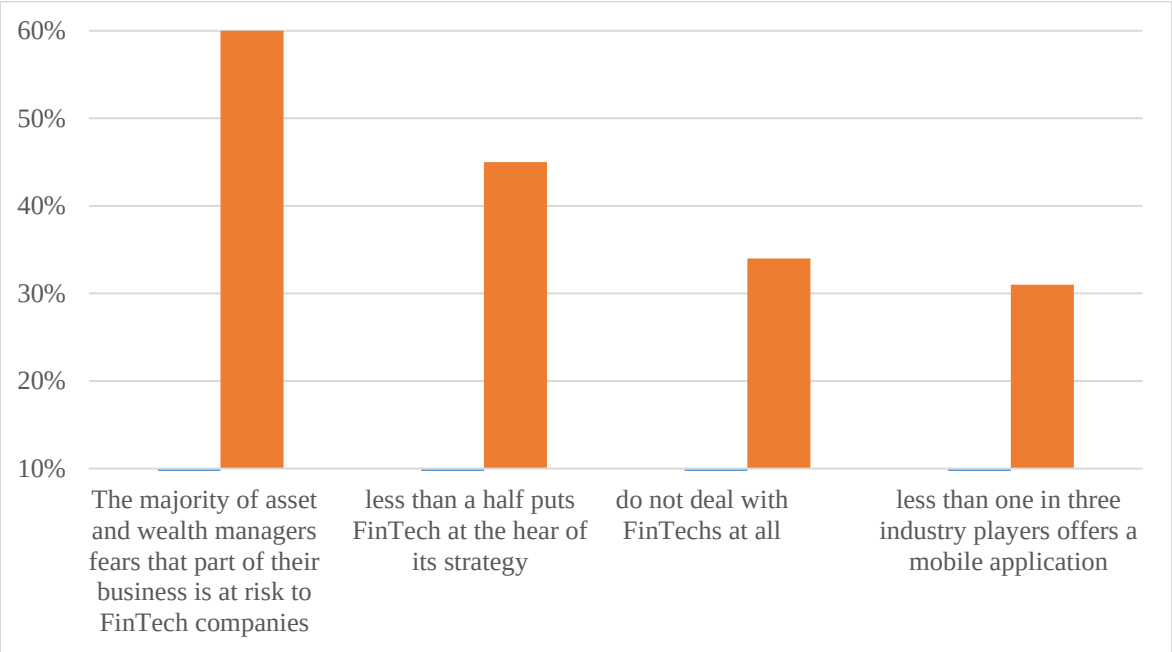
The link between finance and modern technology is transforming the usual framework of professional asset and wealth management. Using the Big Data, AI, as well as machine learning, investment managers are able to better spot and analyse investment opportunities, optimize investment portfolios, and the most important reduce risk to a lowest level possible. When talking about the financial record keeping and blockchain, we can say that the link between two is becoming stronger since there are new and creative ways to record, track, store, and maintain transaction for financial assets. All those technological advancements are having an impact, not only on professional quantitative asset managers, but also on fundamental asset managers who exploit all of those tools and available technology to make proper investment decisions. Since the financial technology or Fintech industry is growing rapidly on a global level, traditional asset managers need to spot the opportunities as well as threats to their market share. The crucial question concerning professional investment managers is if there are any opportunities to exploit in this new sector. It definitely seems there are huge opportunities to exploit, as according to Citigroup report, around $19 billion of incremental investment has flowed into the sector over the 2015. Most of the investment was directed towards the payments area, and currently this is where banks are seeing the most competition with new entrants.

The key issue that we will try to address in this part of this master's thesis is the impact of Fintech on investment profession. As investors' profiles, appetite, preferences and technology continues to break new bounds, professional asset managers need to figure out how to deal with Fintech revolution, by being able to incorporate Fintech into their sophisticated investment strategies or face being left behind. Due to the huge growth of automated financial advisors, so called „robo-advisors", investment advisory services are undergoing drastic changes. The so called automated advisors or robo-advisors are able to deal with the clients requests without the help or coordination from human advisor. Providing custom, tailored and specialized advice at a lower cost is one of the main functions that those automated advisors are capable of doing. According to the published report by

Statista, the total amount of world assets that are managed by robo-advisers is expected to grow at an annual rate of 38.2% in the period between mid-2018 – mid-2020 and it is not surprising that those in the asset management industry are starting to worry about the future of their careers (Mason, 2018) .

A research conducted by PwC, „Beyond Automated Advice: How Fintech in shaping Fintech asset & Wealth Management“ found that 60% of asset and wealth managers fear losing part of their business to Fintech companies. Same research revealed that not more than 34% of companies actually engage Fintech companies at all, while only 31% offer a mobile features to its valuable clients. Watching Fintech trends by the asset and wealth managers should be integral part of their investment strategy in order to be able to adopt a responsive digital strategy.

Figure 2: Presence of Fintech



Source: PwC (2016)

During the 1980, professional asset and wealth managers thought that they are leading the way with technology and that disruptions in their industry wouldn't pose a threat to their profitability. New competitors, who commoditized trade execution, by lowering the price that companies can charge per trade, were able to increase their profit margin and attract more clients. There has been also a common misunderstanding that, so called „robo-advisors“ are less valuable and capable than professional investment managers, and so far they have been mostly used for managing low balance accounts. In essence, the statement proved to be wrong, as the innovations under so called umbrella of „robo-advisors“ are becoming more technologically sophisticated which indeed enable „robo-advisors“ to manage higher balance accounts. Those „robo-advisors“ create huge opportunities for professional investment managers to target clients who are looking for more affordable

advices on how to manage their investment portfolio. According to the PwC's Global Fintech research, professional asset management is the third most likely field to be disrupted (35%), while 60% of investment managers think that at least one part of their business is at risk to Fintech disruption, which is lower than most other financial sectors. Having a thorough understanding of Fintech revolution and its impact on the industry indeed seems like the most reasonable step forward in order to nurture proper relationship between investment manager and its client.

It is also worth saying that only 31% of investment companies have developed mobile applications to support its business and enhance client's investment experience. In order to cope with Fintech revolution, investment companies have started investing heavily in development of new technologies with their interest focused largely on data analytics and automation of asset allocation. Data analytics is becoming crucial in order to be able to compete, manage risk, and improve overall investment efficiency. Nowadays technology is cable of transforming risk management using machine learning, and thus enabling computers to identify patterns in market behaviour and analyse transaction in real time. This reduces so called asymmetry of information between participants on financial markets. Another important aspect of how Fintech is essentially reshaping asset and wealth management industry is the introduction of „robo-advisors“ as we already mentioned previously in the text above. All innovations that we can see nowadays in financial industry under the umbrella of „robo-advisors“ are becoming more and more sophisticated and used by Fintech start-ups in the process of enhancing digital experience. Professional asset managers who embrace the trend of Fintech revolution and become actively involved in creating better customer value through advances in technology are ultimately going step forward compared to their competitors and there is a great chance that indeed they become first-movers in the process of incorporating so called broader and multi-source data sets which at the ends creates holistic view of the customers. All those alternative business models that we are able to see these days, such as marketplaces and investor networks are transforming the traditional way the investments are made. As an example we can use a crowdsourcing platforms which attracted a lot of investment community since the users of those platforms are able to benefit from collective wisdom of the communities they nurture. On those platforms investment community exchanges insights, trading practices, and investment algorithms to leverage collective investment intelligence. Investment communities are gaining more and more in popularity as the main aim of those networks is providing financial content and improving interaction between investors. Value created on such networks derives from interaction between investors and financial advisors.

5. FINTECH AND THE ROLE OF ETHICS

In the following part of the master's thesis we will explore the fintech industry from the viewpoint of ethics. Since the fintech is becoming increasingly the major part of consumer's buying and investment habits, we should also consider what are the main challenges and implications in important area and how to cope with all ethical concerns.

5.1 Challenges facing the Fintech industry from both business and customer perspective

In the race to catch up with all the technology advances and their vast applicability in the financial sector, Fintech's are faced with challenging questions they have to deliberate on. At some point customers and regulatory agencies will act upon this question: do the availability and use of Fintech innovations justify the "means", which contribute to the innovation's existence, development and/or efficiency?

5.2 Consumer and intellectual property

Regulatory agencies and directives in EU have already in some way anticipated these challenges that came with disruptive digital technologies, and have enacted two new guidelines for the Fintech's and other businesses to follow: The general data protection regulation (hereafter: GDPR) in 2016, which is an EU law requiring that individual data privacy is to be protected, in EU and EEA (Tiku 2019), and the PSD2 (the 2nd Payment Service Directive), which will de-monopolize the banks authority over personal data of clients, by shifting the permission to third-party companies to retrieve information and even initiate payments. (Riddick, 2019) It includes also increased identity verifications and other accompanying by-laws. In USA there is even a government authorized non-profit agency, Financial Industry Regulatory Agency (FINRA), that ensures investors in using broker-dealer services, on the transparency, fairness and suitability of those engagements (About Finra, 2019).

However, to what extent are these laws and regulations effective in addressing all situations and issues that arise from the implementation of newer disruptive technologies? As Fintech innovations gain more access and with them product diversity offered to customers, come enhanced risks of possible fraud and deliberations of whether the information gathered is processed under secure conditions or is it susceptible to infringement.

Banking institutions, for example, have been heavily regulated, in few occasions since the beginning of the century, due to fraudulent behaviour and the 2008 recession, and even still, managers find loopholes and ways to avoid strict adherence. Fintech's might be faster in adapting to regulation, while the laws are slow to change and be implemented after negative shocks.

Besides fraudulent activity, what happens to personal data after acquisition, where and how is it used? Fintech's should ensure sensibility towards customers, when it comes to data publications on social media (Demir, 2017). As Magazine Fintech weekly in their article suggests, so called sensitivity scales, where a customer can give instructions on the use of his/her data online, provided through a customer's personal space on the online trade website.

Many of the online terms and conditions include lengthy texts with clauses and acts that many customers overlook, due to time considerations or disinterest, and they do not consider where or to whom their trust is placed to. Fintech companies should consider implementing online logs with information about where the personal data of customers has been distributed, shared, sold to (FastInvest, 2019). An even more useful strategy would be to fully interact with customers when it comes to their personal data use. Customers should be able to choose who can get their data, of what type and for what purpose. With offering choices and customization related to customer's privacy, one can share or give power to the customer to co-design the use of their personal data, which enhances trust and loyalty.

5.3 Ethical Artificial Intelligence

Ethical AI is a concept that encompasses several factors: auditable (a third-party assurance), transparent (clarity, consistency), fairness, and understandability, explained in common language (Campgemini, n.d.). The Capgemini research institute, conducted a survey for the report "Why addressing ethical questions in AI will benefit organizations", that relates to matters of ethical AI, with the following findings:

- Ethical considerations boost consumer satisfaction and loyalty;
- Almost half of the survey participants identified ethical issues when in contact with AI-based services in the past 2-3 years.

A widely publicised shared experience by Amazon with introducing AI in their Human resources department to recruit new staff, resulted in a failure due to the biasedness of data from which the AI could extrapolate conclusions and make decisions (Dustin, 2018). The failure stem in the engine not being gender-neutral while choosing the best applicants, and even by modifying the system for that issue, didn't rule out other possible discriminatory outcomes. Another use of AI that is also being researched is related to surveillance/monitoring of employees or the general public (Carpenter, 2019).

By giving customers upgraded products and services they demand, with digitalized user experiences through technology-aided means, Fintech's are obviously driven by consumer's needs. But at some point, after fully emerging into the online world of shopping and experience, customers themselves will start feeling too exposed, as their level of education and understanding of IT also increases. Long-term ethical considerations have to be analysed

by Fintech's and they have to be at the forefront of those future hurdles, by addressing them sooner and integrating them into their business models, before other competitors take lead.

6. EMPIRICAL RESEARCH

This part of the master's thesis deals with the empirical research conducted, research design, methodology, results and findings. Detailed survey that was used for collecting primary data can be found in appendices part of this master's thesis.

6.1 Research design and methodology

The research overall was led by the combination of primary and secondary research techniques. As it was noticed in the first part of the thesis, secondary research method was used. The collected data from series of case studies represented in books, articles, websites and various reports will represent the theoretical framework, with the ultimate aim to providing an answer to the first research question. The second part of the research dealt with collecting primary data in order to provide an answer to the second research question. In this process, the intent was to analyse what the respondents thought of disruptive financial technologies, how they impacted their lives, as well as whether and how often they used them.

Ultimately, the decision was made to use an online survey as a primary research tool.

The online survey was conducted by means of using "1ka", a Slovene survey web platform which is suitable for developing questionnaires and ultimately generating responses. The main purpose behind choosing an online survey was due to the fact that it created a possibility to capture a significant amount of responses.

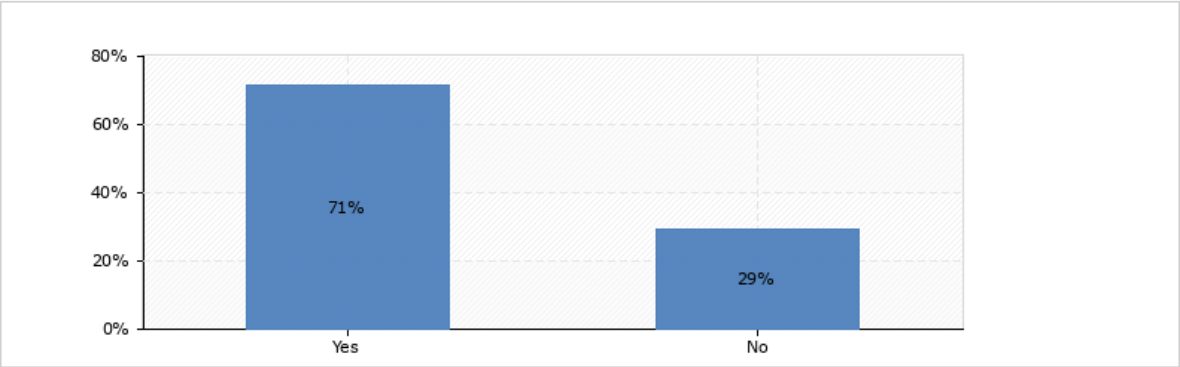
The sample technique was online sampling since all respondents were invited to fill in the questionnaire through email invitations or social media invitations. The restriction was not placed on who could fill in the questionnaire since there was no need for it.

The questionnaire itself was opened on 20 September 2019 and closed on 20 December 2019. In total there were 280 responses, but only 121 of those were valid. In the very beginning of the questionnaire all respondents were informed about the purpose of the questionnaire and that it was undertaken by a student of the University of Ljubljana. Since the intended result was to include people from the region, or, more specifically, from Bosnia and Herzegovina, Croatia and Slovenia, the questionnaire was written in English. Finally, the approach which was used in developing the questionnaire was the funnel technique, with first questions being quite general to the last questions being related to specific matters.

6.2 Results and findings

Figure 3 below provides an overview of the results to the first question which was related to the notion whether the respondents used new technologies in banking. Out of 121 valid units, 71% of respondents said they did use them, while 29% gave negative responses.

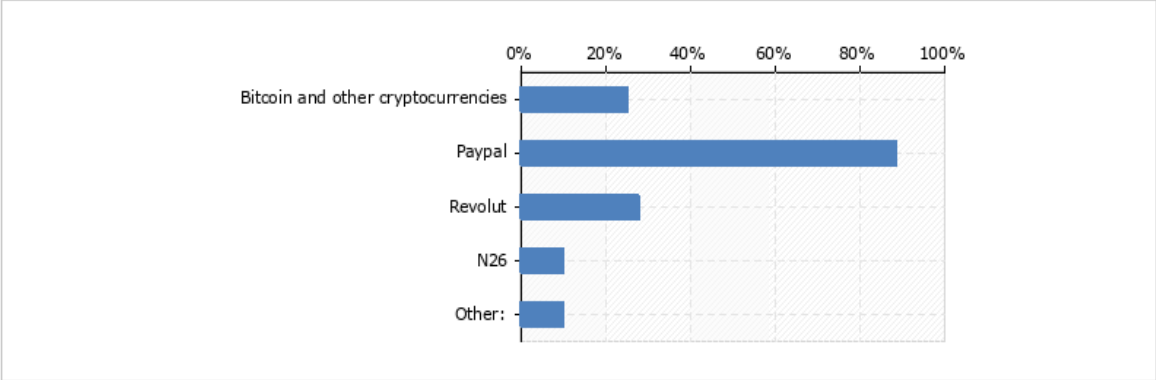
Figure 3: The consumer use of new technologies in banking (N=121)



Source: Own work.

Based on the first response, the respondents were taken to two different questionnaire sections. The first one tried to build upon the usage patterns of those who said they used new technologies in banking, while the other one was trying to understand why respondents did not use them. The former will first be described here.

Figure 4: Percentage of new technologies in banking used by consumers (N=79)

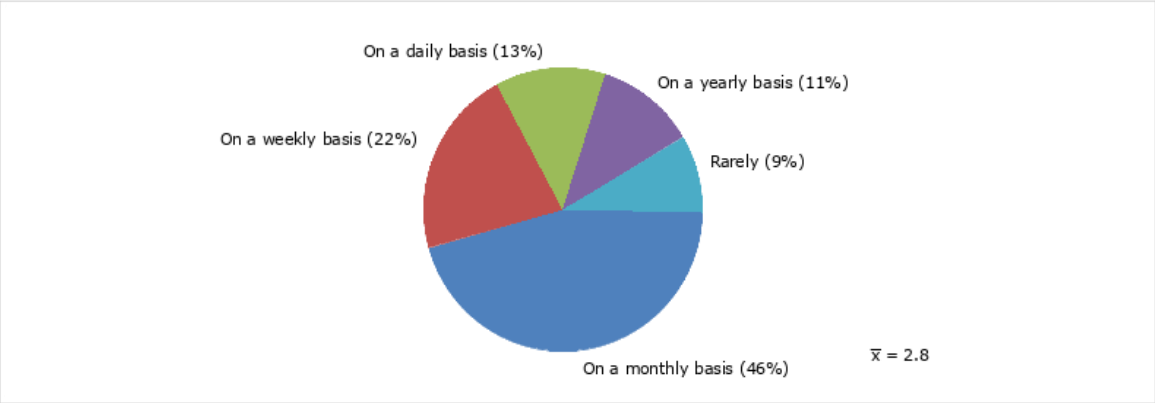


Source: Own work.

Figure 4 above provides an overview of the results to the question related to the use of new technologies in banking. More than 80% of respondents stated they used Paypal. Revolut came in second with above 20%, followed by Bitcoin and similar cryptocurrencies. Less than 10% stated they used N26, and a similar number said they used other technologies.

Since respondents were tasked with writing which other options they were using, they wrote, among other, the following ones: Alipay, Ebase, Abanet, Ethereum, e-banking and bank mobile apps, Paysafe cards and Skrill.

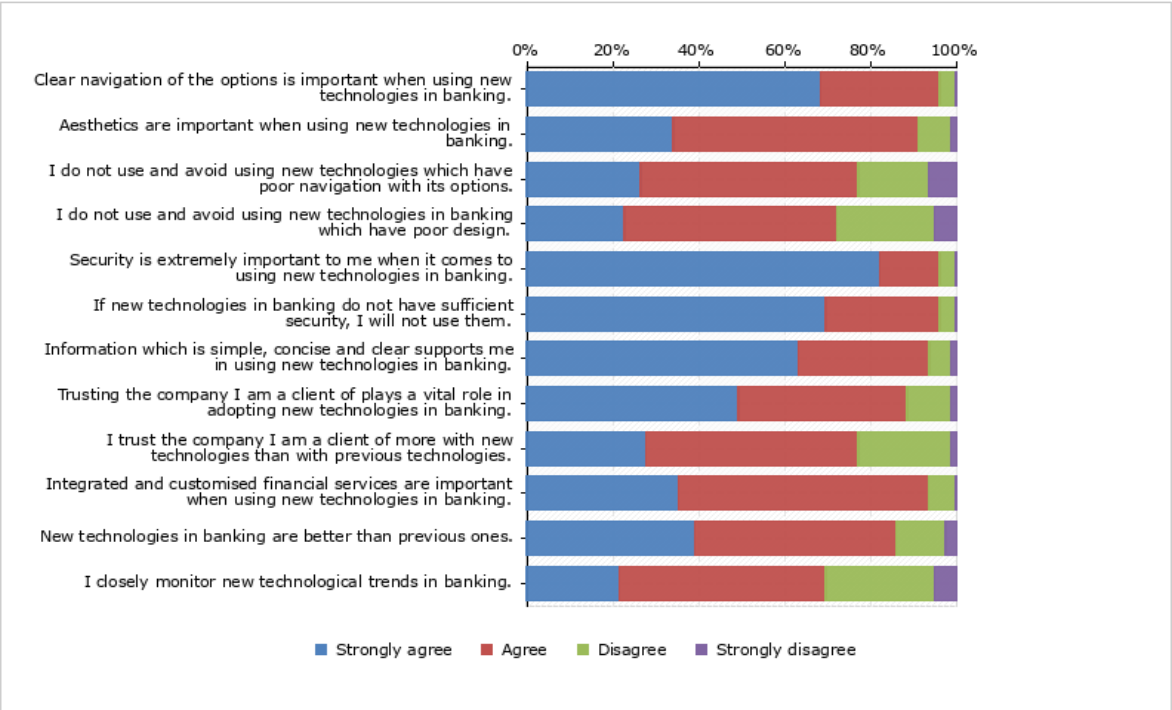
Figure 5: Frequency of use of new technologies in banking (N=79)



Source: Own work.

In the Figure 5 above the results of the question that deals with the frequency of using new technologies in banking were presented. From the survey analysis, we can conclude that 46% of the respondents said they used them on a monthly basis, followed by 22% on a weekly basis. 13% of them wrote that they used them daily, while 11% said yearly. The smallest amount of them, 9% to be precise, used them rarely.

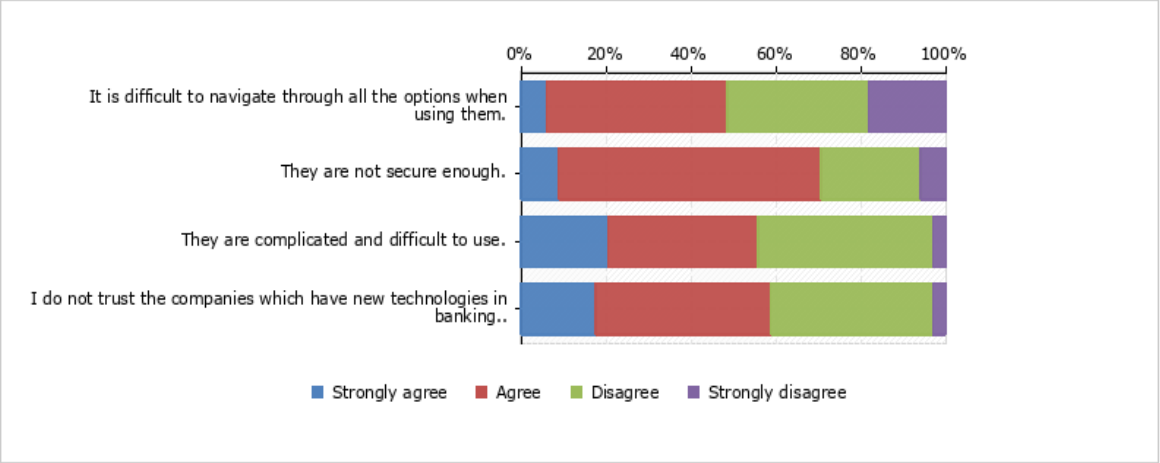
Figure 6: Reasons behind using new technologies in banking (N= 79)



Source: Own work.

What was also measured in the questionnaire was a plethora of statements which would better capture the reasons behind using, or, not using enough, new technologies in banking as presented in Figure 6. Statements with which respondents have strongly agreed and agreed are related security, clear presentation of information and clear navigation. The biggest percentage of statements with which the respondents have disagreed or strongly disagreed are related to whether respondents followed and monitored new technological trends in banking, avoiding using new technologies in banking which have poor design and trusting existing service providers than new ones. However, all these statements managed to cumulatively acquire around 20% - 30% each, thus not representing a substantial factor.

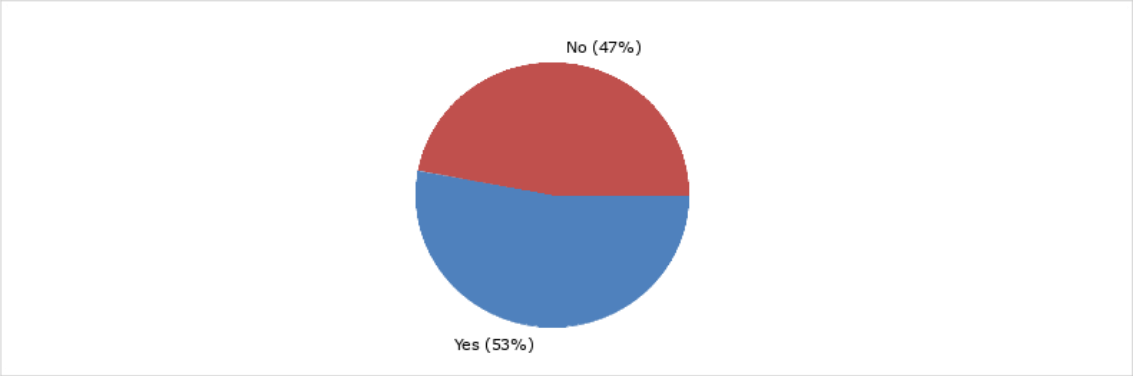
Figure 7: Reasons for not using new technologies in banking (N=34)



Source: Own work.

The other section of the questionnaire, as it was stated previously, dealt with those respondents who did not use new technologies in banking as being presented in Figure 7. The factor which most likely determined not using new technologies in banking was the difficulty of navigation through options. However, it should be noted that this statement, in addition to three others, were not formidable in percentage points.

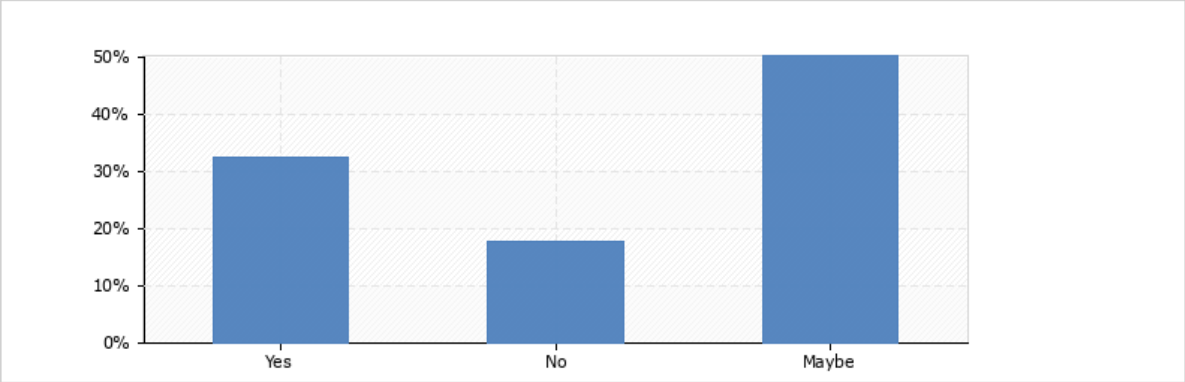
Figure 8: New technologies in banking are better than old ones (N=79)



Source: Own work.

When respondents were asked whether they believed new technologies in banking were better than the previous ones, the opinion was divided, as being shown in Figure 8 above, with 53% claiming they were and 47% stating they were not.

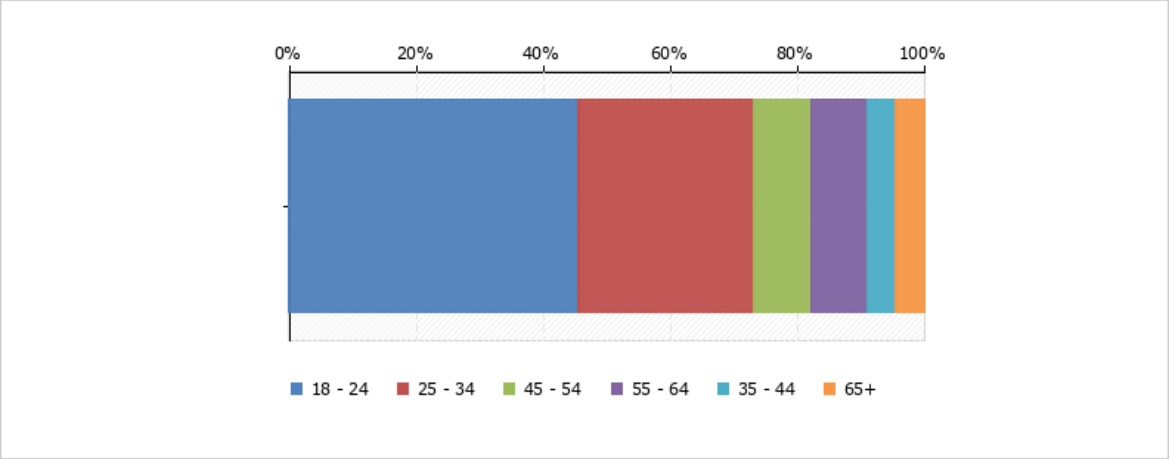
Figure 9: Possible change of opinions about new technologies (N=79)



Source: Own work.

Ultimately, those that were not using and new technologies in banking were asked whether they will change their opinion and start using them as presented in Figure 9 above. Less than 20% stated no, more than 30% said yes and around 50% wrote maybe.

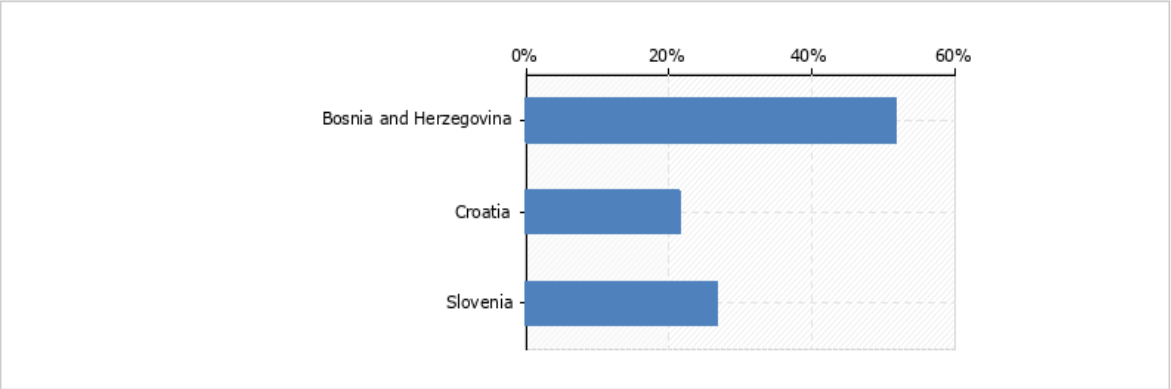
Figure 10: Age of respondents (N=112)



Source: Own work.

In the last section of the questionnaire, the respondents were asked demographic questions. Regarding the age distribution, as shown in Figure 10, more than 40% of our respondents are between 18 and 24 years of age and around 30% belong to 25-34 range. The smallest percentage is related to those who are above 65 years of age.

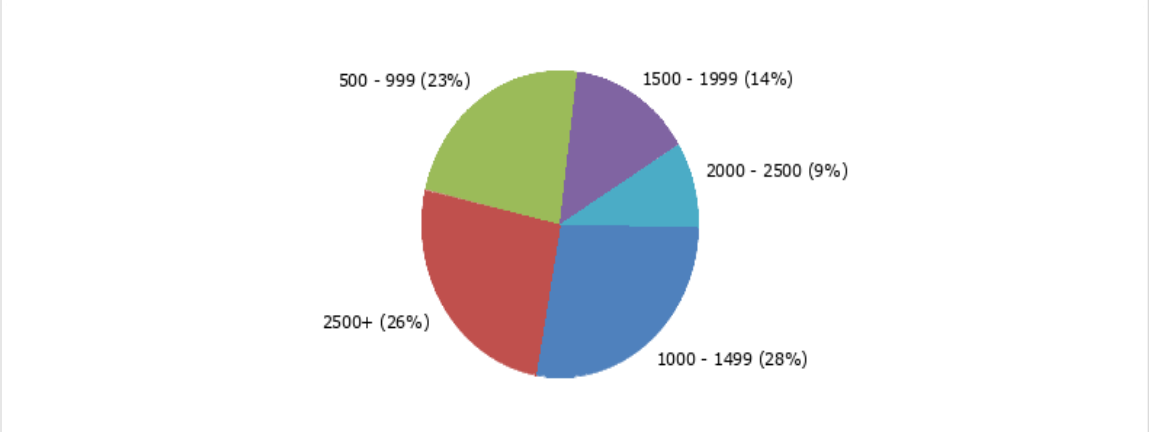
Figure 11: Current country of residence of respondents (N=112)



Source: Own work.

When it comes to the country of residence, the majority of around 50% of our respondents came from Bosnia and Herzegovina, followed by close to 30% from Slovenia and 20% from Croatia as being presented in Figure 11.

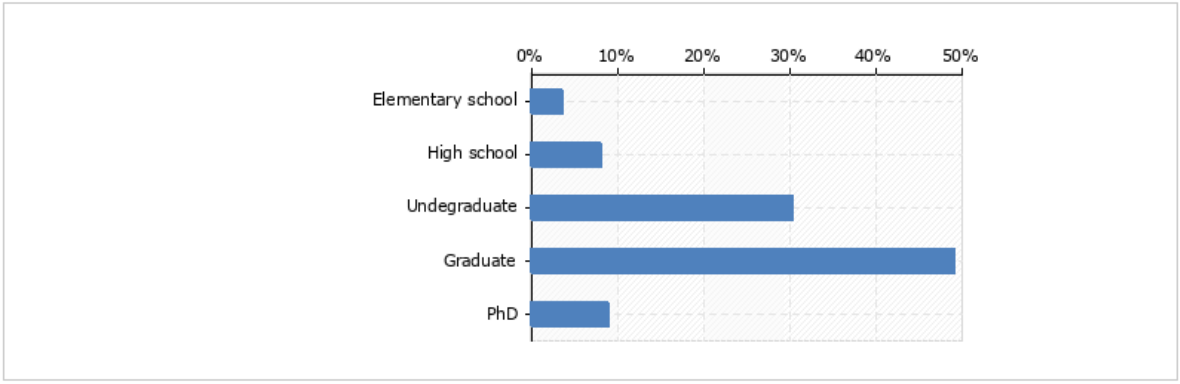
Figure 12: Monthly household income in EUR (N=112)



Source: Own work.

One of the last questions was related to the monthly household income in euros. As shown in Figure 12 above, the biggest amount of our respondents belong to the 1000-1499-euro group, or 28% of them. They were followed by those earning more than 2500 euros and those earning between 500 and 999, with 26% and 23% respectively. 14% attributed to household earnings between 1500 and 1999, while the smallest amount of 9% belonged to the 2000-2500 group.

Figure 13: Current level of education (N=112)



Source: Own work.

Finally, the last question measured the current level of education. As shown in Figure 13, close to 50% of respondents hold a graduate degree, followed by 30% of those who are undergraduates. The smallest amount deals with those who are in elementary school or high school with less than 10% each.

7. DISCUSSION

In the following part of the master's thesis we will go through theoretical contributions and practical implications of conducted empirical research. In the part of theoretical contributions we try to connect and support empirical findings with the secondary resources, mainly articles, books and other relevant resources, used in the first part of the master's thesis On the other side, in the part practical implications we try to see how this research can benefit the financial service industry and what indeed can be used in practice which can provide those organizations a huge competitive advantage in the upcoming years.

7.1 Theoretical contributions

After summarising the survey findings conducted in three countries (Bosnia and Herzegovina, Slovenia and Croatia), one can distinguish many numerical indicators that go hand in hand with the theoretical underpinnings.

The first statement which appears and links the research with the theory deals with the transition of services in the banking sector. More than two thirds of survey participants are already using, on a monthly basis, new and improved banking services. These services in use, out of all outlined ones, were only Fintech solutions. Furthermore, traditional banking institutions which had the largest market shares in the past did not provide them. Looking back at the rise of new technologies, there are several things worth noting. First of all, the surge of credit cards and ATMs almost revolutionised the means of payment in its booming phase in 1950s and 1960s. Despite these services not being seen as modern as they were in the past, back then they were seen just like that. More importantly, it was shown that people

can quickly adapt and transition to new technologies, and do so in large numbers, when certain processes become more efficient. The increased efficiency did not only positively impact the customers, but also the providers as well. Banks managed to significantly cut their costs of human resources and also provided larger money turnover.

Nowadays, with the expanding Fintech 3.0 and its futuristic Fintech 3.5 version, rapid technological advancement created fertile ground for almost all consumers to become heavily invested in personalizing their own experiences. This later allowed the creation of numerous start-ups trying to specifically target those particular markets with new technologies. Ultimately, the service becomes cheaper, more efficient and more customer-oriented. E.g., Revolut believed that numerous imposed fees on financial transactions should either be lower or non-existent. Driven by their own purpose, they created numerous options which created their customers. From slashing the cost of previously over-priced transactions to the fee-free multi-currency options or even free international transfers within the Revolut community (Wilkinson, 2016). With all of this, they managed to amass 4.5 million customers by 2019, and the numbers keep growing. In general terms, as seen from the theoretical part of the thesis, three out of four customers ultimately use Fintech solutions for money transfers, closely confirming questionnaire results (Russon, 2019).

The other finding further contributing to the theory deals with privacy issues. As anticipated by scholars who praise big data as the new and sought-after means for companies to capitalize on extensive consumer data and analytics provided online, there are also side-effects which no-one would like to experience. The survey results stressed out that customers place "trust" or lack of it, as a reason for turning down services of a company. The fact that this is a number one reason listed, allows current Fintech's a perspective on how they need to approach customers and their business model in the near future. The discomfort is still not unionized, regulated or wide-spread in the community of customers, but eventually it might be.

Governments and other institutions clearly see this as a problem and are trying to tackle it while imposing clear regulations. GDPR mandates that all EU and EEA citizens should have their personal data privacy protected (Tiku, 2019). In the United States of America, the Financial Industry Regulatory Agency (hereafter: FINRA) represents a government authorized agency which seeks to validate transparency, fairness and sustainability of investors using broker-dealer services (About Finra, 2019). What is also seen as a potential benefit to Fintech companies, amidst its privacy issues, is that they could be quicker to implement certain changes in regulation than traditional banks.

Fintech companies, apart from adhering to legal regulations in different countries, can also seek to adjust their own policies and operations so that they could be deemed more secure by the customer. According to the theoretical background, this can be done in different ways. Some sort of simple online logs can provide customers how, where and when personal information is being distributed and whether customers would like to modify or cancel such

arrangements (FastInvest, 2019). Fintech companies can also decide to directly communicate with their customers in this process, ultimately giving the power of co-designing the usage of personal information required for the system to be fully operational and eventually profitable.

There are numerous examples when customers are impacted by improper handling of their personal information. With the introduction and implementation of AI, it is becoming increasingly frequent for companies to collect personal information from their customers without letting them know (Carpenter, 2019). Such infringements in the matters of personal information and its collection and distribution by companies bears difficult questions, and the most important of them is, when is it enough? What if certain customers are shown specific products and services which they require, but did not publically state or share, just because a program captured their purchase records? What if this piece of information about individuals is later on shared with numerous other companies, all with the intent to maximise profits? And who can guarantee that this information can be stored safely and not breached nor accessed by unauthorised or even malicious entities? Ultimately, answering these questions, and more, properly, links the questionnaire result about privacy with the theoretical statement that those companies which work and on ethical considerations and how these practices can best be applied, will inevitably boost consumer satisfaction and loyalty.

7.2 Practical implications

Fintech companies, despite their intense and thorough adaptability, are still in conflict with traditional banking institutions. That is why they are in the process of using their innovative banking solutions to properly position themselves on a higher ground. It is also further anticipated from both parties that they would involve their customers through more modern service-provision channels, replacing the outdated and usually costly options that more senior customers still prefer and opt for. This generational clash is going to be transitioned soon, and even the seniors will have to adjust to this with the help of their younger family members. Those members of the younger population, if not already using new technologies in banking, will eventually transition, leaving only a small percentage of users not being exposed and fully utilizing these services, as it can clearly be seen from almost every step of the Fintech evolution. Even in these three countries whose industry is not considered to be high-tier technology oriented, and is implementing new banking solutions after the models already pioneered in other countries, the survey indeed outlined 70% of the participants already using new technologies in banking.

Many of the new banking solutions are provided by companies which offer businesses a lot of cost-cutting options. It should also come as no surprise that those services are exactly the ones being mostly and most frequently used in these mentioned countries, since the start-ups and generally the SMEs have begun emerging in unprecedented quantities. This means that

the focus should be placed on serving not only local customers, but also creating solutions such as Paypal and Revolut to enable easier money transfers and international payments.

Practically speaking, the era of modern banking will continue to be disruptive with ever-improving user interfaces, focusing on accessibility and visual performance. From the survey results, one can suggest that customers are continuously placing these features as important to them, and would always readily accept an improved, cheaper version of a service they already use.

One, already identified obstacle for Fintech's and banks innovations in the present and the future, will be the issue of security and personal data infringement. From the survey results, participants outlined that they do not tolerate companies whom they cannot trust. And unfortunately, the deal-breaker for many new-comers will be, how to capitalize on a great innovation, without imposing on personal data of its customers to achieve that goal. Discussed in the chapter before this one, there are numerous ways in which companies can try to safeguard personal information, while also trying to find alternative sources of income when compared to distributing this information to third-party organisations, or even using it for better targeting.

7.3 Limitations and future directions

The online research signified certain limitations. The overwhelming majority of those who were invited to partake in the questionnaire were from social media, or, more specifically, Facebook. While we originally presumed that the majority of people who use social media might also new technologies in banking, it is also true that not all those who use new technologies in banking also use social media. Furthermore, the non-response rate, even though it was not calculated, can fairly be assessed by being very low. While there was a number of people being invited through Facebook and various Facebook groups, there were only 280 of them who responded. And out of those 280, only 121 were valid. It should also be noted that, while it was difficult to track whether some respondents filled in the questionnaire more than once, that might still be a possibility, since the restrictions were not placed within the system. Another limitation was that the analysis of the results was only using descriptive statistics.

Observing the potential implementation of similar research in the future, there are plenty of methods how the scope can be increased and even more information captured. Greater focus can be placed on researching users from countries in different stages of technological development in order to assess the correlation between technological savviness of citizens and their usage patterns. More qualitative studies can be used to for which purposes do people use bank innovations in their daily lives. Further connections can be made between different socio-economic, demographic and other groups in ways the use new technologies in banking in their lives.

Since ethics of organisations is looming large in our close future, with a lot of corporate entities being held to high standards, from privacy to environment, more research can be made about companies which provide these services. This can include numerous research focuses, from strategic business models and their utilisation to marketing techniques and customer service.

CONCLUSION

Over the course of several decades and especially during recent years, there has been a massive surge of IT development. New technologies are finding ways into our daily lives, adapting our way of living and even seeing the world around us. In a similar fashion, technology development has also induced growth in various industries, including the financial industry. Apart from simplifying the services we use, Fintech represents a wholesome approach in how we perceive and use finances.

Fintech companies go beyond themselves and disruptors they essentially represent. The ever-growing and expanding evolution of different parts of the financial industry reaffirms this notion. From massive banks and other well-established financial institutions, e.g. JPMorgan Chase and BNP Paribas, to big tech companies which are expanding to the financial industry, e.g. Facebook and Google, and ultimately the companies which provide the infrastructure for financial services, e.g. MasterCard and Visa. All of these companies and more are but a piece in the overall puzzle of the Fintech evolution.

Regardless in which way this master's thesis and numerous other studies on this topic are used, one statement is guaranteed: whatever happens in the world, the advancement of new technological breakthroughs in almost all spheres of human life and activity will be rapid. As time passes by, we will see even more of it up to the point when it will encompass almost all of our activities. The question, not only for us, but to the industry as well, is: how will we respond to it?

REFERENCE LIST

1. Andy Binns, J. Bruce Harreld, Charles O'Reilly III, and Michael L. Tushman (2013). *The Art Of Strategic Renewal*. Obtained 18 December 2019 from https://sloanreview.mit.edu/article/the-art-of-strategic-renewal/.
2. Apprenda. (n.d.). *Definition of Hybrid Cloud.* Obtained 18 Oktober 2019 from https://apprenda.com/library/glossary/hybrid-clouds-a-definition/?from=singlemessage.
3. Arons, S. (2019). *Deutsche Bank Plans About Half of 18,000 Job Cuts in Germany*. Obtained 18 March 2020 from https://www.bloomberg.com/news/articles/2019-10-08/deutsche-bank-plans-about-half-its-18-000-job-cuts-in-germany.
4. B. J. Mack and R. Kissell, PhD (n.d.). *Fintech in Investment management*
5. Bailey, D. (2017). *Why Airbnb Is Disruptive Innovation And Uber Is Not.* Obtained 17 December 2019 from https://www.inc.com/dave-bailey/why-airbnb-is-disruptive-innovation-and-uber-is-not.html.
6. Bassano, C. (2019a). *5 Ways Fintech Is Reshaping the Financial Services Industry*. Obtained 15 December 2019 from https://www.business2community.com/finance/5-ways-Fintech-is-reshaping-the-financial-services-industry-02228834.
7. Bassano, C. (2019b). *Fintech Trends Paving the Way to the Future in Banking*. Obtained 18 Oktober 2019 from https://www.business2community.com/finance/Fintech-trends-paving-the-way-to-the-future-in-banking-02247447.
8. Berkemeyer, N. (2016). *Competing with Disruptive Business Models in Traditional Industries. Conceptualisation of a Strategic*. Munich: Grin Publishing.
9. Beyond Digital: *How Can Banks Meet Customer Demands?* (2017) Obtained 19 September 2018 from https://www.accenture.com/_acnmedia/accenture/next-gen-3/dandm-global-research-study/accenture-banking-global-distribution-marketing-consumer-study.pdf.
10. Bird, D. (2017). *How Emerging Technologies Are Impacting Industries.* Obtained 17 December 2019 from https://medium.com/swlh/how-emerging-technologies-are-impacting-industries-b85afc14b5d.
11. BitDegree. (2020). *What Is a Smart Contract and How Do Smart Contracts Work*? Obtained 21 January 2019 from https://www.bitdegree.org/tutorials/what-is-a-smart-contract/.
12. Bloomberg News. (2019). *Why China's Rushing to Mint Its Own Digital Currency*. Obtained 15 November 2019 from https://www.bloomberg.com/news/articles/2019-09-10/why-china-s-rushing-to-mint-its-own-digital-currency-quicktake?utm_medium=social&utm_campaign=socialflow-

organic&utm_content=economics&cmpid%3D=socialflow-twitter-economics&utm_source=twitter.

13. Capgemini. (n.d.) *Are Your AI-Enabled Interactions Ethical?* Obtained 15 December 2019 from https://www.capgemini.com/research/why-addressing-ethical-questions-in-ai-will-benefit-organizations/.
14. Carpenter, R. (2019). *The Ethics of Artificial Intelligence in the Workplace.* Obtained 10 April 2019 from https://www.workforce.com/2019/08/07/the-ethics-of-artificial-intelligence-in-the-workplace/.
15. CB Insights Research (2019): The Startups Helping Businesses Mitigate Risk And Monitor Compliance Across Industries. Obtained 22 November 2019 from https://www.cbinsights.com/research/regtech-regulation-compliance-market-map/.
16. Daisyme, P. (2018). *What Is Disruption, Really? 8 Examples And What To Learn From Them.* Obtained 17 Oktober 2019 from https://www.startupgrind.com/blog/what-is-disruption-really-8-examples-and-what-to-learn-from-them/?fbclid=IwAR3_sALfmMgK3ANd9fYk6lDkWqrzyjzeiRI4mYQYA0D7OC2fcbV-cgpkNso.
17. Davis, S. (2019). *Online Mortgage Lenders Vs. Brokers: Which Should You Use?* Obtained 18 Oktober 2019 from https://www.moneyunder30.com/online-mortgage-lenders-vs-brokers-10571.
18. Deloitte. (2017). *Beyond Fintech: Eight Forces That Are Shifting the Competitive Landscape.* Obtained 10 September 2019 from https://www2.deloitte.com/global/en/pages/financial-services/articles/beyond-Fintech-pragmatic-assessment-disruptive-potential-financial-services.html.
19. Demir, R. (2017). *What about the Ethics of Fintech?* Obtained 18 December 2019 from https://magazine.Fintechweekly.com/articles/what-about-the-ethics-of-Fintech.
20. Dodgson et al. (2008). *Types of innovation strategies.* Obtained 23 July 2019 from https://www.business.qld.gov.au/running-business/growing-business/becoming-innovative/strategy/types.
21. Emprechtinger, F. (2018a). *What is a business model innovation?* Obtained 18 November 2019 from https://www.lead-innovation.com/english-blog/what-is-a-business-model-innovation.
22. Emprechtinger, F. (2018b). *3 famous business model innovations and what you can learn from them.* Obtained 18 November 2019 from https://www.lead-innovation.com/english-blog/famous-business-model-innovations.
23. FastInvest. (2019). *Securing FinTech: Challenges of Cybersecurity*. Obtained 18 December 2019 from https://www.fastinvest.com/en/blog/securing-Fintech-challenges-of-cybersecurity.

24. Finextra. (2019). *How Fintech is shaping assets and wealth management*. Obtained 19 April 2019 from https://www.finextra.com/blogposting/18168/how-Fintech-is-shaping-assets-and-wealth-management.
25. FINRA. (2019). *About FINRA*. Obtained 14 November 2019 from https://www.finra.org/about.
26. Fintech News. (2019). *Big Data as a Tool to Improve Customer Experience*. Obtained 25 December 2019 from https://www.Fintechnews.org/big-data-in-banking-all-that-you-should-know/.
27. Fintech Trends. (2019). *7 Exciting Uses of Machine Learning in Fintech*. Obtained 2 July 2019 from https://rubygarage.org/blog/machine-learning-in-Fintech.
28. Forbes. (2019). *Why Fintech Should Embrace The Fourth Industrial Revolution.* Obtained 11 March 2020 from https://www.forbes.com/sites/madhvimavadiya/2019/04/23/why-Fintech-should-embrace-the-fourth-industrial-revolution/#6c296086868f.
29. Friedberg, A. B. (2019). *How Do Robo Advisors Work and Everything Else You Need to Know*. Obtained 17 April 2019 from https://www.roboadvisorpros.com/how-do-robo-advisors-work/.
30. Garn, J., Heinz, J., Armstrong, L. W., D'Amato, M. A., Gorton, S., Mattingly, M., Hecht, C., Gramm, P., Proxmire, W., Cranston, A., Riegle, W. D., Sarbanes, S. P., Dood, J. C., Dixon, J. A., Sasser, J., Wall, D. M., McLean, A. K., Boland, E. J., & Mulloy, P. (1985). *Comprehensive Reform In The Financial Services Industry*. Washington: U.S. Goverment Printing Office.
31. Garth, D. (2019). *The Future Of Insurance – Limitless Possibilities*. Obtained 17 April 2019 from https://coverager.com/the-future-of-insurance-limitless-possibilities/.
32. Gibson, R. (2018). *Strategic Renewal in the Business Model.* Obtained 25 December 2019 from https://www.innovationexcellence.com/blog/2013/02/06/strategic-renewal-in-the-business-model/
33. Girotra, K., & Netessine, S. (2014). *Four Paths to Business Model Innovation*. Obtained 25 November 2019 from https://hbr.org/2014/07/four-paths-to-business-model-innovation
34. Horowitz, B. (2019). *3 Examples Of Disruptive Business Models – BusinessTown.* Obtained 12 November 2019 from https://businesstown.com/shows/business-plans/3-examples-disruptive-business-models/
35. Hult News. (2015). *How innovative business models can reshape an industry.* Obtained 17 December 2019 from https://www.hult.edu/blog/innovative-business-models-can-reshape-industry/
36. Innosight. (n.d.). *Business Model Innovation*. Obtained 18 February 2019 from https://www.innosight.com/leadership-agenda/innovating-business-models/

37. Kh, R. (2018). *How Big Data Can Play An Essential Role In Fintech Evolution*. Obtained 17 December 2019 from https://www.smartdatacollective.com/Fintech-big-data-play-role-financial-evolution/.
38. Kumar, V. (2014). *Making "Freemium" Work*. Obtained 15 April 2019 from https://hbr.org/2014/05/making-freemium-work.
39. Langridge, M., & Willings, A. (2019). *Life in the future: Tech that will change the way we live.* Obtained 18 December 2019 from from https://www.pocket-lint.com/gadgets/news/142027-tech-innovations-that-will-shortly-change-the-world
40. Lauren Mason (2018). How will Fintech impact the asset management industry? Obtained 16 June 2019 from https://www.investmentweek.co.uk/investment-week/feature/3065834/how-will-Fintech-impact-the-asset-management-industry
41. Legters, B. (2019). *Five Ways 5G Might Change How You Bank*. Obtained 17 December 2019 from https://www.forbes.com/sites/boblegters/2019/05/15/five-ways-5g-might-change-how-you-bank/#1c1fc7075fc8.
42. Marous, J. (2018). *10 Technologies That Will Disrupt Financial Services In The Next 5 Years*. Obtained 17 December 2019 from https://thefinancialbrand.com/77228/technology-trends-disrupting-financial-services-banking-future/.
43. Martucci, B. (n.d.). *Top 10 Equity Crowdfunding Sites for Investors & Entrepreneurs*. Obtained 22 Oktober 2019 from https://www.moneycrashers.com/equity-crowdfunding-sites-investors-entrepreneurs/.
44. Mellino, E. (2019). *Revolut Says It's Cleaning up Its Act. Evidence Suggests Otherwise.* Obtained 19 May 2019 from https://www.wired.co.uk/article/revolut-compliance-free-work-Fintech-application-toxic-storonsky.
45. Michael Tertilt and Peter Scholz. "To Advise, or Not to Advise—How Robo-Advisors Evaluate the Risk Preferences of Private Investors," The journal of Wealth Management, vol. 21, no. 2, 2017, pp. 70-81
46. Miller, D. (2019). *The Sharing Economy And How It Is Changing Industries*. Obtained 28 April 2019 from https://www.thebalancesmb.com/the-sharing-economy-and-how-it-changes-industries-4172234.
47. Mintos. (2019). *What Is Peer to Peer Lending?: Mintos: Lending, P2P Investing*. Obtained 19 Oktober 2019 from https://www.mintos.com/en/how-it-works/.
48. Mittal, R. (n.d.). *Everything You Need to Know About Sending Money with TransferWise.* Obtained 11 May 2019 from https://www.stilt.com/blog/2018/02/international-money-transfer-service-transferwise-review/.
49. Moore, R. (2019). *11 Disruptive Innovation Examples (And Why Uber And Tesla Don'T Make The Cut).* Obtained 15 July 2019 from

https://openviewpartners.com/blog/11-disruptive-innovation-examples-and-why-uber-and-tesla-dont-make-the-cut/#.XjgmC2hKjIU.

50. Moskowitz, D. (2019). *Who Are Netflix's Main Competitors?* Obtained 9 February 2019 from https://www.investopedia.com/articles/markets/051215/who-are-netflixs-main-competitors-nflx.asp.
51. Muirí, Ó. N. (2013). *We live in a world of change*. Obtained 22 Oktober 2019 from https://axaxl.com/fast-fast-forward/articles/we-live-in-a-world-of-change.
52. Myatt, M. (n.d). *Disruptive Business Models*. Obtained 7 May 2019 from http://hub.n2growth.com/the-power-of-disruption/.
53. NOWPayments. (2019). *8 Major Companies That Accept Bitcoin [Pay In Bitcoins]: NOWPayments: Blog.* Obtained 13 November 2019 from https://nowpayments.io/blog/8-major-companies-that-accept-bitcoin-pay-in-bitcoins/.
54. Olechowski, A. (2019). *Top 10 European Fintech Startups To Watch In 2019*. Obtained 19 April 2019 from https://codete.com/blog/the-Fintech-era-top-10-european-Fintech-startups-to-watch-in-2019-growth-tips-for-the-future-market-leaders/.
55. Oracle. (n.d.) *What Is Big Data?* Obtained 4 March 2019 from https://www.oracle.com/big-data/guide/what-is-big-data.html.
56. Osing, R. (2015). *5 Essentials Of Strategic Renewal*. Obtained 27 May 2019 from https://talentculture.com/5-essentials-of-strategic-renewal/.
57. Pratap, M. (2018). *Everything You Need to Know About Smart Contracts: A Beginner's Guide*. Obtained 24 September 2019 from https://hackernoon.com/everything-you-need-to-know-about-smart-contracts-a-beginners-guide-c13cc138378a.
58. Pritchard, J. (2019). *Have You Looked Into Borrowing With P2P Lenders?* Obtained 19 March 2019 from https://www.thebalance.com/how-peer-to-peer-loans-work-315730.
59. PwC. (2016). Beyond Automated Advice: How Fintech is shaping asset & Wealth Management. Obtained 18 September 2019 from https://www.pwc.com/gx/en/financial-services/pdf/fin-tech-asset-and-wealth-management.pdf.
60. Quindazzi, M. (2017). *What Is Blockchain... And Why Should I Care?* Obtained 22 July 2019 from https://thefinancialbrand.com/65247/blockchain-bitcoin-banking-trends/?internal-link.
61. Ramos, S., & Laurent, B. (2019). RegTech Universe. Obtained 17 September 2019 from https://www2.deloitte.com/lu/en/pages/technology/articles/regtech-companies-compliance.html.
62. Rosic, A. (2016). *What Is Blockchain Technology? A Step-by-Step Guide For Beginners.* Obtained 8 June 2019 from https://blockgeeks.com/guides/what-is-blockchain-technology/.

63. Rosic, A. (2018). *What is Ethereum? The Most Comprehensive Beginners Guide.* Obtained 14 February 2020 from https://blockgeeks.com/guides/ethereum/.
64. Rouse, M. (2019). *What Is Hybrid Cloud?* Obtained 7 June 2019 from https://searchcloudcomputing.techtarget.com/definition/hybrid-cloud.
65. Russon, M.A. (2019). *What Is Revolut?*. Obtained 15 June 2019 from https://www.bbc.com/news/business-47768661.
66. Sarkar, A. (2019). *Here's Why Innovation is the Key to Success of Any Business*. Obtained 24 April 2019 from https://www.entrepreneur.com/article/319397.
67. SAS. (n.d.). *Machine Learning: What It Is and Why It Matters*. Obtained 17 April 2019 from https://www.sas.com/en_us/insights/analytics/machine-learning.html.
68. Sharma S. (2018). *AI Virtual Assistants Making Banking Easier For Everyday Consumers*. Obtained 15 December 2019 from https://www.Fintechnews.org/10-ai-powered-virtual-assistants-making-banking-easier-for-everyday-consumers/
69. Shepherd, M. (2019). *Stripe vs. PayPal vs. Square: Which Is Right for Your Business?* Obtained 17 April 2019 from https://www.fundera.com/blog/stripe-vs-paypal-vs-square.
70. Shevlin, R. (2019a). *Are Fintech Startups More Ethical Than Banks?* Obtained 28 April 2019 from https://www.forbes.com/sites/ronshevlin/2019/10/21/are-Fintech-startups-more-ethical-than-banks/#36b8058e502d.
71. Shevlin, R. (2019b). *Bank/Fintech Partnerships: The Fad Is Over*. Obtained 28 April 2019 from https://www.forbes.com/sites/ronshevlin/2019/10/14/bank-Fintech-partnerships-the-fad-is-over/#533acf1b7527.
72. Suarez, R. (2019). *Bank-Fintech Partnerships Are a Necessity, Not a Fad. Obtained* 22 March 2019 from https://bankinnovation.net/allposts/innovation/startups/bank-Fintech-partnerships-are-a-necessity-not-a-fad/.
73. Sven, C.V., Marius, L., & Eden, B. T. (2003). The wheel of business model reinvention: how to reshape your business model to leapfrog competitors. *Journal od Change Management, 4*(3), 259-276.
74. Szakiel, P. (2019). *What Is Regtech? (+4 Types of Regtech Solutions).* Obtained 22 April 2019 from https://learn.g2.com/regtech.
75. Talin, B. (2019). *9 Disruptive Business Models For 2020 - New Opportunities For Companies*. Obtained 15 June 2019 from https://morethandigital.info/en/9-disruptive-business-models-new-opportunities-for-companies/.
76. Tay, A. (2018). *NFC vs QR Code Payment. Obtained* 12 June 2019 from https://www.linkedin.com/pulse/nfc-vs-qr-code-payment-alex-tay.
77. Tertilt, M., & Scholz, P. (2018). To Advise, or Not to Advise—How Robo-Advisors Evaluate the Risk Preferences of Private Investors. *The journal of Wealth Management, 21*(2), 70-81.
78. The Financial Brand. (2019). *Top 5 Digital Banking Transformation Trends Shaping 2020*. Obtained 17 April 2019 from https://thefinancialbrand.com/90562/digital-banking-transformation-platform-Fintech-data-marketing-trends/.

79. Thompson, S. (2019). *Difference Between a Proactive & a Reactive Business Strategy*. Obtained 25 June 2019 from https://smallbusiness.chron.com/difference-between-proactive-reactive-business-strategy-62157.html
80. Tiku, N. (2018). *How Europe's New Privacy Law Will Change the Web, and More*. Obtained 12 April 2019 from https://www.wired.com/story/europes-new-privacy-law-will-change-the-web-and-more/.
81. Tredgold, G. (2019). *3 Things Your Business Must Do to Remain Competitive.* Obtained 12 November 2019 from https://www.inc.com/gordon-tredgold/3-things-your-business-must-do-to-remain-competitive.html
82. Vantage. (2017). *The 10 Characteristics of Millennial Shoppers You Need to Know*. Obtained 13 March 2019 from https://gotvantage.com/10-characteristics-millennial-shoppers/.
83. W. Arner Douglas, Barberis Janos, Buckley P. Ross. "The Evolution of Fintech: A New Post-Crisis Paradigm?" SSRN Electronic Journal. Vol 47, no.4, 2016, pp.1271-1319. https://www.researchgate.net/publication/313365410_The_Evolution_of_Fintech_A_New_Post-Crisis_Paradigm.
84. Wessel, M. (2011). *Why Spotify Will Kill Itunes.* Obtained 22 June 2019 from https://hbr.org/2011/07/why-spotify-will-kill-itunes.
85. Whitney, O. J. (1996). *Strategic Renewal For Business Units*. Obtained 17 September 2019 from https://hbr.org/1996/07/strategic-renewal-for-business-units.
86. Wilkinson, H. (2016). *Revolut: The Disruptive Platform Taking The Headache Out Of International Payment - Real Business.* Obtained 22 November 2019 from https://realbusiness.co.uk/revolut-the-disruptive-platform-taking-the-headache-out-of-international-payment/.
87. Wojtowicz, H. (2019). *Why Financial Services Move to Hybrid Cloud.* Obtained 19 Oktober 2019 from https://www.nutanix.com/theforecastbynutanix/industry/why-financial-services-move-to-hybrid-cloud.
88. Zigurat. (n.d.). *Evolution of Fintech*. Obtained 15 November 2019 from https://www.e-zigurat.com/innovation-school/blog/evolution-of-Fintech/.

APPENDICES

Appendix 1: Summary in Slovene language

Živimo v svetu, polnem sprememb, in mnoge od njih vodi izključno tehnologija (Muirí, 2019). Prihodnost, ki je pred nami, ohranja nepregledne vidike napredka in predstavlja izziv za radovedne. Kot posledica je prisoten stalen in neprekinjen korak h tehnološkemu napredku. Mladi, ki živijo v današnjem svetu, poznajo le čas neprimerljive eksponentne tehnološke rasti. Medtem ko smo že opazili nekaj prebojev v inovativni tehnologiji, je treba velik del idej še preučiti in raziskati. Čeprav ne vemo, kakšni bodo ti futuristični izumi, lahko deloma ugibamo na podlagi tega, kar nam je že bilo predstavljeno (Sharma, 2019). Tehnologija resnično spreminja naš način življenja in dela ter vpliva tako na posameznike, kot tudi na poslovne subjekte. Medsebojna povezanost znanosti in tehnologije nam lahko olajša življenje le če jo izkoristimo na pravi način (Langridge & Willings, 2019).

V tem hitro spreminjajočem se svetu, kjer sta tehnologija in inovacije ključnega pomena, je treba slediti vsem tem napredkom. Zaradi globalizacije in velike konkurence je podjetjem težje ostati na vrhu, kot dejansko priti tja (Tredgold, 2019). Če želite biti aktiven akter v poslu, spremeniti igro v panogi in jo prilagoditi lastnim željam, je potrebna mešanica inovativnosti in spretnosti ter druge temeljne poslovne veščine Bistvena razlika med proaktivnimi in reaktivnimi poslovnimi akterji je v odzivnosti na nepričakovane dogodke. Proaktivni igralci znajo predvideti in izkoristiti priložnosti, reaktivni igralci pa se premaknejo šele, ko so priložnost ustvarili in izkoristili drugi igralci v panogi. Podjetja, ki poudarjajo proaktivno strategijo, so učinkovitejša pri soočanju z izzivi. Organizacije, ki uporabljajo proaktivne strategije, lahko obdržijo pobudo v konkurenci z drugimi podjetji (Thompson, 2019)

Kot smo že ugotovili v uvodni razpravi tega prispevka, je treba za ohranitev uspešnega poslovanja, imeti možnost, da opazimo pravi trenutek, ko so potrebne temeljne spremembe in se nanj odzvati. Organizacije s proaktivnimi inovacijskimi strategijami so ponavadi raziskovalno naravnane, imajo glavno prednost in so pripravljene v svoja podjetja uvesti najnovejše tehnologije, ki so na voljo na trgu. Sčasoma tako postanejo vodilne na trgu. Te organizacije dostopajo do znanja iz različnih virov in tvegajo z velikimi stavami. Kot primer take organizacije lahko navedemo naslednje: Dupont, Apple in Singapore Airlines (Dodgson et al., 2008).

Uspešnim inovativnim spremembam poslovnega modela je uspelo preoblikovati celotne panoge in prerazporediti več milijard dolarjev vrednosti (Innosight, 2018). Kot že rečeno, se v današnjem hitro spreminjajočem se poslovnem okolju, ki ga vodijo različni dejavniki, kot so globalizacija, spreminjanje vedenja kupcev in tehnološki napredek, podjetjem ustvarijo številne priložnosti. Vseeno pa jih veliko ljudi ne more uspešno izkoristiti.

Potrebno je omeniti, da nove tehnologije dejansko ustvarjajo nove panoge. Različne industrije lahko strateško izkoriščajo različne nastajajoče inovativne tehnologije in jih izvajajo v svojih vsakodnevnih poslovnih dejavnostih (Bird, 2017)

Glavni namen tega magistrskega dela je preučiti vpliv motečih inovacij na tradicionalne poslovne modele, s posebno pozornostjo na industrijo finančnih storitev. Zanima nas način, na kateri disruptivne inovacije hkrati uničujejo stare in ustvarjajo povsem nove panoge. Kot že omenjeno, bo ena od industrij, ki jo bom posebej poudaril, industrija finančnih storitev. Osredotočil se bom predvsem na novo ustvarjeno industrijo Fintech in učinek njenega ustvarjanja, tako z vidika podjetjam kot kupcev.

Glavni cilj magistrskega dela je odkriti vpliv motečih inovacij na potrošnika v industriji finančnih storitev. To bom raziskal z uporabo različne literature, strokovnih člankov, študij primerov, analiz, spletnih virov, poročil in razpoložljivimi statističnimi raziskavami. Raziskava bo razdeljena na dva medsebojno povezana dela. Prvi del raziskave nam da širok teoretični pregled motečih poslovnih modelov, tehnologije in njenega vpliva na industrijo finančnih storitev. Ta del raziskave obravnava predvsem vprašanja s poslovnega vidika. Zanima nas, v kolikšni meri se tradicionalna podjetja zavedajo motečih inovacij in kakšen bi bil njihov odgovor na vse te napredke. Cilj drugega dela raziskave je odkriti, kakšen bo vpliv motečih inovacij na potrošnika, s poudarkom na industriji finančnih storitev.

Appendix 2: Exported survey from website 1ka.si

An analysis of innovation and disruptive business models based on financial technology

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Survey short title: Fintech survey
Survey long title: An analysis of innovation and disruptive business models based on financial technology
Question number: 12
Survey is closed.
Active from: 20.09.2019 Active until: 20.12.2019
Author: Amer Edited: Amer
Date: 16.09.2019 Date: 20.09.2019
Description:

Hello! My name is Amer Pirija and I am a student of International Master Programme in Business and Organization (IMB) at University of Ljubljana. I am conducting research for my master thesis with a following topic: "An analysis of innovation and disruptive business models based on financial technology". I would appreciate if you could devote approximately 5 minutes to finish this questionnaire. All your answers are anonymous and will be used exclusively for the purpose of this research. I appreciate your help and the time you will take to complete this questionnaire.

Q1 - Do you use new technologies in banking?
E.g. Paypal, Bitcoin, etc.

◯ Yes
◯ No

IF (1) Q1 = [1]
Q2 - Choose from a list which newtechnologies in banking you are using:
You can choose more than one answer.

☐ Bitcoin and other cryptocurrencies
☐ Paypal
☐ Revolut
☐ N26
☐ Other:

IF (2) Q1 = [1]

Q3 - How often do you use new technologies in banking?

- ○ On a daily basis
- ○ On a weekly basis
- ○ On a monthly basis
- ○ On a yearly basis
- ○ Rarely

IF (3) Q1 = [1]

Q4 - Please respond to the following statements ranging from "strongly agree" to "strongly disagree".

	Strongly agree	Agree	Disagree	Strongly disagree
Clear navigation of the options is important when using new technologies in banking.	○	○	○	○
Aesthetics are important when using new technologies in banking.	○	○	○	○
I do not use and avoid using new technologies which have poor navigation with its options.	○	○	○	○
I do not use and avoid using new technologies in banking which have poor design.	○	○	○	○
Security is extremely important to me when it comes to using new technologies in banking.	○	○	○	○
If new technologies in banking do not have sufficient security, I will not use them.	○	○	○	○
Information which is simple, concise and clear supports me in using new technologies in banking.	○	○	○	○
Trusting the company I am a client of plays a vital role in adopting new technologies in banking.	○	○	○	○
I trust the company I am a client of more with new technologies than with previous technologies.	○	○	○	○
Integrated and customised financial services are important when using new technologies in banking.	○	○	○	○
New technologies in banking are better	○	○	○	○

	Strongly agree	Agree	Disagree	Strongly disagree
than previous ones.				
I closely monitor new technological trends in banking.	○	○	○	○

IF (4) Q1 = [2]
Q5 - Why are you not using new technologies in banking?
Please respond to the following statements ranging from "strongly agree" to "strongly disagree".

	Strongly agree	Agree	Disagree	Strongly disagree
It is difficult to navigate through all the options when using them.	○	○	○	○
They are not secure enough.	○	○	○	○
They are complicated and difficult to use.	○	○	○	○
I do not trust the companies which have new technologies in banking..	○	○	○	○

IF (4) Q1 = [2]
Q6 - Do you think new technologies in banking are better than the previous technologies?

○ Yes
○ No

IF (4) Q1 = [2]
Q7 - Will you ever start using new technologies in banking?

○ Yes
○ No
○ Maybe

IF (5) Q4l = [1, 2, 3, 4] and Q7 = [1, 2, 3]
Q8 - Gender

○ Male
○ Female

Q9 - Age

○ 18 - 24
○ 25 - 34

○ 35 - 44
○ 45 - 54
○ 55 - 64
○ 65+

Q10 - Current country of residence

○ Bosnia and Herzegovina
○ Croatia
○ Slovenia

Q11 - Monthly household income (in EUR)

○ 500 - 999
○ 1000 - 1499
○ 1500 - 1999
○ 2000 - 2500
○ 2500+

Q12 - Current level of education

○ Elementary school
○ High school
○ Undegraduate
○ Graduate
○ PhD