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# Financial technology

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**Financial technology**, often shortened to **fintech**, is the technology and innovation that aims to compete with traditional financial methods in the delivery of financial services.[1] It is an emerging industry that uses technology to improve activities in finance.[2] The use of smartphones for mobile banking, investing services[3] and cryptocurrency are examples of technologies aiming to make financial services more accessible to the general public. Financial technology companies consist of both startups and established financial institutions and technology companies trying to replace or enhance the usage of financial services provided by existing financial companies.

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## Definition [ edit ]

After reviewing more than 200 scientific papers citing the term "fintech," a study on the definition of fintech concluded that "fintech is a new financial industry that applies technology to improve financial activities."[4] Fintech is the new applications, processes, products, or business models in the financial services industry, composed of one or more complementary financial services and provided as an end-to-end process via the Internet.[3] Fintech can also be considered as "any innovative ideas that improve financial service processes by proposing technology solutions according to different business situations, while the ideas could also lead to new business models or even new businesses." [5] The goal of "fintech" companies, both old and new, is to improve financial processes and increase automation in the industry.[6] "Fintech" technology use can exist in the front, middle, and back office operations of companies.

## Key areas [ edit ]

Financial technology has been used to automate insurance, trading, banking services, and risk management.[7]

The services may originate from various independent service providers including at least one licensed bank or insurer. The interconnection is enabled through open APIs and open banking and supported by regulations such as the European Payment Services Directive.

In trading on capital markets, innovative electronic trading platforms facilitate trades online and in real time. Social trading networks allow investors to observe the trading behavior of their peers and expert traders and to follow their investment strategies on currency exchange and capital markets. The platforms require little or no knowledge about financial markets, and have been described as disruptors which provide *"a low-cost, sophisticated alternative to traditional wealth managers"* by the World Economic Forum.[8]

Robo-advisers are a class of automated financial adviser that provide financial advice or investment management online with moderate to minimal human intervention.[9] They provide digital financial advice based on mathematical rules or algorithms, and thus can provide a low-cost alternative to a human advisers.

Global investment in financial technology increased more than 2,200% from $930 million in 2008 to more than $22 billion in 2015.[10] The nascent financial technology industry in London has seen rapid growth over the last few years, according to the office of the Mayor of London. Forty percent of the City of London's workforce is employed in financial and technology services.[11]

In Europe, $1.5 billion was invested in financial technology companies in 2014, with London-based companies receiving $539 million, Amsterdam-based companies $306 million, and Stockholm-based companies receiving $266 million in investment. After London, Stockholm is the second highest funded city in Europe in the past 10 years. Europe's fintech deals reached a five-quarter high, rising from 37 in Q4 2015 to 47 in Q1 2016.[12][13] Lithuania is starting to become a northern European hub for financial technology companies since the news in 2016 about the possible exit of Britain from the European Union. Lithuania has issued 51 fintech licenses since 2016, 32 of those in 2017. [14]

Fintech companies in the United States raised $12.4 billion in 2018, a 43% increase over 2017 figures. [15]

In the Asia Pacific region, the growth will see a new financial technology hub to be opened in Sydney, in April 2015.[16] According to KPMG, Sydney's financial services sector in 2017 creates 9 per cent of national GDP and is bigger than the financial services sector in either Hong Kong or Singapore.[17] A financial technology innovation lab was launched in Hong Kong in 2015.[18] In 2015, the Monetary Authority of Singapore launched an initiative named Fintech and Information Group to draw in start-ups from around the world. It pledged to spend $225 million in the fintech sector over the next five years.[19]

## Technologies [ edit ]

Within the financial services industry, many technologies have emerged to be some of the top "fintech" technologies. Some of these technologies include the Internet of Thing (IoT), Artificial Intelligence (AI), Big Data, Robotic Process Automation (RPA), Blockchain.

For the Internet of Things, the technology is used by the customers of financial institutions. For example, IoT devices are entering the homes of consumers, these devices allow people to be more connected. IoT creates an opportunity for companies to create pay-by-use business strategies. For financial institutions, they would be able to offer customers with the means to track their utility usage so that they would be able to save money.[20] The Internet of Things is also changing the way people make payments. In the past, a credit card or cash was needed to pay for something or if you wanted to deposit money into your bank account you had to physically go into a bank. IoT eliminates all of this. With connected devices such as smartphones and watches, people have access to their bank accounts wherever and whenever. This enables financial institutions to offer mobile pay and mobile banking. [21]

Artificial Intelligence is a blanket term for many different technologies. In terms of the "fintech" industry, AI used in various forms. AI algorithms can be used to predict changes in the stock market and give insight into the economy. AI is used to provide insight on customer spending habits and allows financial institutions to better understand their clients. [22] Chatbots are another AI-driven tool that banks are starting to use to help with customer service.[23] These chatbots can understand and interpret human text and provide customers with a solution or connect them with a representative to solve the issue.

Big Data is another "fintech" technology that financial institutions utilize. Data is becoming a keystone of many businesses and financial institutions. In the finance sector, big data can be used to predict client investments and market changes and create new strategies and portfolios. Big Data can be used to analyze customer spending habits and therefore improve fraud detection. Big Data can essentially be utilized in every facet of a finance company. In the back office it can be used to analyze and mitigate risk, in the front and middle offices it can be used to provide more personalized customer services. [24] Big Data helps banks create segmented marketing strategies and can be used to optimize the operations of a company. [25]

Robotic Process Automation is an artificial intelligence technology that focuses on automating specific repetitive tasks. In terms of "fintech", RPA is used to perform manual tasks that often are repetitive and completed daily. These tasks just involve the input of information into a system and do not require much skill thus companies are replacing them with RPA which can complete the task quicker and more efficiently. RPA helps to process financial information such as accounts payable and receivable more efficiently than the manual process and often more accurately. RPA can be used to increase the productivity of the financial company.[citation needed]

Blockchain is another AI technology that is beginning to be used in the finance industry. Out of all the "fintech" technologies, blockchain was developed for finance purposes and thus has direct ties to financial institutions. Blockchain is still being an emerging a technology, but many companies are recognize the impact that it will have. Blockchain is being more accepted by fintech companies and other companies throughout the industry and therefore more investment are being made into the technology. [26]

## Awards and recognition [ edit ]

Financial magazine *Forbes* created a list of the leading disruptors in financial technology for its Forbes 2019 global Fintech 50.[27] In Europe there is a list called the FinTech 50,[28] which aims to recognise the most innovative companies in fintech.[29]

A report published in February 2016 by EY commissioned by the UK Treasury compared seven leading fintech hubs: the United Kingdom, California, New York City, Singapore, Germany, Australia and Hong Kong. It ranked California first for 'talent' and 'capital', the United Kingdom first for 'government policy' and New York City first for 'demand'.[30]

For the past few years, PwC has posted a report called the "Global Fintech Report". In the 2019, the report covers many topics revolving around the financial technology sector. The report discusses the landscape of the "Fintech" industry and some of the emerging technologies in the sector. It provides strategies for financial institutions on how to incorporate more "fintech" technologies into their business. [31]

## Outlook [ edit ]

Finance is seen as one of the industries most vulnerable to disruption by software because financial services, much like publishing, are made of information rather than concrete goods. In particular blockchains have the potential to reduce the cost of transacting in a financial system.[32] While finance has been shielded by regulation until now, and weathered the dot-com boom without major upheaval, a new wave of startups is increasingly "disaggregating" global banks.[33] However, aggressive enforcement of the Bank Secrecy Act and money transmission regulations represents an ongoing threat to fintech companies.[34] In response, the International Monetary Fund (IMF) and the World Bank jointly presented Bali Fintech Agenda on October 11, 2018[35] which consists of 12 policy elements acting as a guidelines for various governments and central banking institutions to adopt and deploy "rapid advances in financial technology".[36]

The New York Venture Capital Association (NYVCA) hosts annual summits to educate those interested in learning more about fintech[37]. In 2018 alone, fintech was responsible for over 1,700 deals worth over 40 billion dollars[38].

## Challenges and solutions [ edit ]

The examples and perspective in this section **deal primarily with the United States and do not represent a worldwide view of the subject**. You may improve this section, discuss the issue on the talk page, or create a new article, as appropriate. *(June 2018) (Learn how and when to remove this template message)*

In addition to established competitors, fintech companies often face doubts from financial regulators like issuing banks and the Federal Government.[39][40]

Data security is another issue regulators are concerned about because of the threat of hacking as well as the need to protect sensitive consumer and corporate financial data.[41][42] Leading global fintech companies are proactively turning to cloud technology to meet increasingly stringent compliance regulations.[43]

The Federal Trade Commission provides free resources for corporations of all sizes to meet their legal obligations of protecting sensitive data.[44] Several private initiatives suggest that multiple layers of defense can help isolate and secure financial data.[45]

In the European Union, fintech companies must adhere to data protection laws, such as GDPR. Companies need to proactively protect users and companies data or face fines of 20 million euros, or in the case of an undertaking, up to 4% of their total global turnover.[46] In addition to GDPR, European financial institutions including fintech firms have to update their regulatory affairs departments with the Payment Services Directive (PSD2), meaning they must organise their revenue structure around a central goal of privacy.[47]

Any data breach, no matter how small, can result in direct liability to a company (see the Gramm–Leach–Bliley Act)[48] and ruin a fintech company's reputation.[49]

The online financial sector is also an increasing target of distributed denial of service extortion attacks.[50][51] This security challenge is also faced by historical bank companies since they do offer Internet-connected customer services.[52]

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