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Financial Technology (FinTech) – Not an Oxymoron!

Anyone who has ever applied for life insurance knows that it is a very involved process. First, there is an extremely long, paper-based questionnaire that is often followed by a telephone interview. A medical technician then visits to take basic height and weight measurements and to collect blood and urine specimens. If a red flag appears from either the questionnaire or lab report, a more complete medical exam by a physician may be required. With the applicant's permission, the insurance company gathers personal information from outside databases containing driving records, prescription drug usage, financial records, and so on. Then, all of this is evaluated by an underwriter who employs very specific and detailed rules and guidelines to assign a risk classification which results in a premium quote assuming that the applicant is insurable. The entire process typically takes three to four weeks.

What if a consumer could fill out an on-line, user-friendly questionnaire and then instantaneously receive a premium quote and coverage? Well, that is a reality today for applicants in certain age groups who request policy face values that fall below certain dollar limits that are specified by each insurance company. **That is financial technology or FinTech!**

In this case, it takes the form of algorithmic underwriting which incorporates big data and artificial intelligence to make more timely and accurate risk assessments. As life insurance companies gain experience with this technology, it is likely to be expanded to a much broader set of applicants, and these tools also enhance the productivity and accuracy of human underwriters who continue to handle large and complex cases.

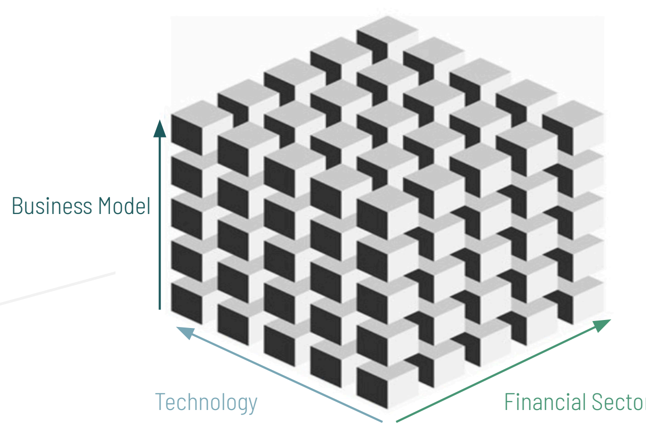
Various forms of FinTech are being implemented by a wide variety of financial services companies with two basic objectives that are related in many ways:

- **Internal focus** - To reduce cost, improve performance, and make operations more efficient
- **External focus** - To improve the customer experience

I will describe a number of specific applications later but suffice it to say that FinTech is integral to many parts of the financial world including banking, trading, asset management, transaction and payment systems, insurance, foreign exchange, and crypto.

THE FINTECH CUBE

Because it is multi-faceted, FinTech is somewhat difficult for us laymen to digest. FINTECH Circle developed the following conceptualization which helps a great deal. Note that the cube has three axes: Financial Sector, Business Model, and Technology. The Financial Sector axis includes among others Retail Banking, Commercial Banking, Trading, Asset Management, and Insurance. The Business Model axis covers Business to Business (B2B), Business to Consumer (B2C), Business to Government (B2G), Crowdfunding, and Peer to Peer (P2P). Various technologies will be covered in the next section but principal among them are Cloud Computing, Big Data and Artificial Intelligence. The important takeaway is that every FinTech application can be classified by finding the appropriate block in the FinTech Cube that represents the intersection of the three axes. While much of this is technical and certainly not top of mind for most of us, the critical point is that virtually everyone uses one or more of these applications on a frequent if not daily basis.



Source: FINTECH Circle, 2020

TECHNOLOGIES UNDERLYING FINTECH

For a deeper dive into technology, please see my White Paper **Revolution: The Impact of Technology.** Here is a very brief description of those technologies that are most relevant to FinTech:

- **Artificial Intelligence (AI)** - The ability of machines to sense, comprehend, learn, and act with human-like intelligence. Familiar applications include web search engines such as Google, virtual assistants such as Siri, and self-driving cars.
- **Machine Learning** - A branch of AI in which a machine makes predictions or decisions without being explicitly programmed to do so. The machine trains itself by studying and analyzing data, and its performance improves with experience.
- **Big Data** - The declining cost of storage has resulted in the accumulation of the massive amounts of data necessary to operate AI and Machine Learning and to conduct analytics in a wide range of applications.
- **Cloud Computing** - The delivery of computing services including servers, storage, databases, networking, software, analytics, and intelligence-all over the Internet. Cloud Computing offers faster innovation, flexible resources, and economies of scale. This technology has been particularly important in enabling startups because it obviates the need for large initial capital outlays.
- **Robotic Process Automation** - A technology to automate repetitive tasks in which a software robot (Bot) learns a task by watching the user perform it.
- **Blockchain** - A digital database or ledger that is distributed among the nodes of a peer-to peer network. The key concept is that a blockchain guarantees the security of data without the need for a trusted third party.

Those seeking a somewhat deeper understanding of these technologies will find that websites such as Wikipedia offer explanations that are more thorough yet still understandable. However, most of us are not interested in seeing how the sausage is made so the remainder of this paper focuses on the organizations investing in FinTech, the applications they have developed, and the risks inherent in them.

WHO IS INVESTING IN FINANCIAL TECHNOLOGY?

At a high level, it is useful to think in terms of two broad sets of participants in the financial technology race. First are existing, often large, financial services firms that seek to reduce costs, gain efficiency, and enhance their product and service offerings. These organizations enjoy deep resources and have therefore been the source of a good deal of innovation. The second group consists of younger companies that are attempting to disrupt the incumbent players. These companies are frequently funded by private equity and venture capital funds. In many cases, the established companies have been forced to alter their business models in the face of intense competition from the upstarts.

Major financial service firms do not break out their expenditures on financial technology so our best information on the level of global investment is the funding of independent FinTech companies. Annual global investment rose from $930 million in 2008 to $226.5 billion in 2021, a growth rate of more than 50% per year. There were more than 5,000 individual financings in 2021 and there are an estimated 11,000 FinTech startups in the Americas alone. The two segments that received the largest amount of investment in 2021 were payment systems at $51.7 billion and crypto/blockchain at $30.3 billion. FinTech is also developing quickly in Europe and Asia as indicated by the fact that the combined investment in these regions in 2021 was roughly equal to the total outlay in the U.S. As just one data point, the Mayor of London has stated that 40% of the London workforce consists of employees in the finance and technology sectors with roughly 40% of that number working directly in FinTech. Of the $226 billion of global investment in 2021, $83 billion represented investment on the part of corporate affiliated venture funds that seek both a financial return as well as a window on new technology.

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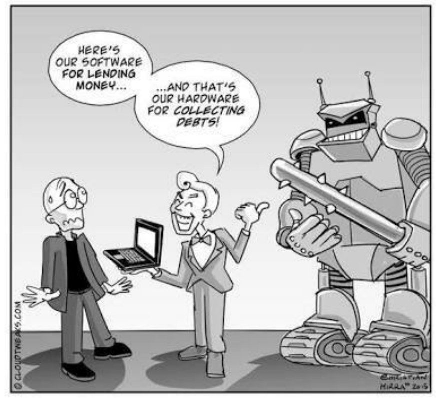
FINTECH APPLICATIONS



FinTech applications are generally divided into five broad groups: Digital Banking, Investments, Personal Finance, Blockchain/ Crypto, and RegTech. Many of the applications could easily fall into any of several different categories so the classifications are somewhat arbitrary. I will skip RegTech which represents the application of technology to the compliance function at financial services firms since it is not relevant to most of us. For the other categories, I describe some applications that are offered by traditional financial services companies and also profile some of the very interesting products and services that have been developed by emerging companies. With some 11,000 competitors in this space, I can only scratch the surface, but hopefully these examples provide a sense of the excitement and disruption in the financial world.

BANKING

The best way to evaluate the role of FinTech in banking is to divide these firms into three groups. First, traditional banks still account for 65% of consumers' primary bank accounts despite the fact that 9% of their branches have been shuttered over the past five years. Rather than occupying physical space, banks have increasingly employed their technology resources to provide mobile and online banking apps that handle basic banking business such as account balance queries, depositing checks, automated savings, and moving funds between accounts. Traditional banks offer a wide array of products and services, in-person customer service, and large ATM networks, but these come at a cost which is generally lower interest rates on deposits and higher account fees.

The next group is digital banks that provide exclusively online or mobile services. The lack of brick and mortar costs generally allows them to pay higher interest rates on savings products, reimburse ATM fees, and charge minimal or no account fees. About 27% of Americans use an online-only bank. Two highly regarded competitors are *Ally Bank* and *Discover Bank*, digital financial services companies that offer a full suite of products including checking and savings accounts, CDs, credit cards, IRAs, securities brokerage, and home loans. Ally and Discover have stock market capitalizations of $9.3 billion and $26.4 billion, respectively.

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The final group consists of a large number of interesting younger companies that are challenging traditional banking practices. As an alternative to conventional banks, *Chime* offers a simple package of a checking account, Visa Credit Card, and savings account. There is no minimum account balance, no fees are charged, and the entire relationship is managed via an intuitive smartphone app. *MoneyLion's* stated goal is to rewire the financial system by offering a mobile banking app that includes digital banking, cash advances, automated investing, credit building loans, and budgeting assistance. Both of these companies make extensive use of Artificial Intelligence and Data Analytics.

While 48% of Baby Boomers report using digital banking services, 80% of Millennials use them which gives a clear indication of where the banking industry is headed.

INVESTMENTS

Algorithmic trading is one investment application of FinTech that is fascinating but not very relevant to most of us. Basically, it involves the use of Artificial Intelligence and Machine Learning to sift through huge amounts of data in order to develop profitable trading strategies. AI software is capable of very complex pattern recognition, it can incorporate a huge number of variables even including input from social media, and it offers the additional advantage of eliminating human emotion. Orders are placed instantaneously by a computer and most of these strategies entail very short time horizons and huge portfolio turnover. In fact, roughly 70% of U.S. stock trading volume is attributable to them. These systems are used by the trading desks of large financial firms as well as by a large number of niche trading funds.

Of more interest to most of us are products and services that are offered to consumers and the broad investing public. First, Roboadvisors are computer based tools that assist individuals with basic financial planning, asset allocation, portfolio construction, investment selection, and periodic rebalancing. Each client fills out an online questionnaire that includes information on investment goals, risk tolerance and so on. This information feeds the algorithm that constructs and maintains the portfolio over time. The primary advantage of these programs is that they entail lower fees than those charged by more traditional investment advisors. On the downside, Roboadvisors are largely if not completely automated whereas many individuals prefer a relationship with a human who provides a high level of personal touch. Roboadvisor services are offered by major financial firms such as Vanguard as well as by more niche players such as *Betterment* and *Wealthfront*.

Trading platforms are offered by majors including *Fidelity, Merrill,* and *Ameritrade* as well as disrupters such as *Robinhood*. These platforms are typically accessed through an app and entail neither minimum account balances nor commissions. Moreover, they enable investing and trading in a wide variety of vehicles including stocks, options, ETFs, and crypto. These platforms are somewhat controversial. On the one hand, they have "democratized" investing by allowing those with minimal resources to begin to build wealth. On the other, they are certainly used by some to speculate resulting in serious losses for some. One widely reported example involved college students who squandered their tuition money in losing trades.

PERSONAL FINANCE

This is a very broad segment that includes insurance, financial planning, credit management, and a number of other applications. I begin with insurance, a category in which FinTech has come to be known as InsurTech. At the beginning of this paper, I briefly described algorithmic life insurance underwriting that uses Big Data and Artificial Intelligence to assign risk classifications to applicants. While development of these programs is ongoing, it appears they improve mortality accuracy by 6-9% as compared to human underwriters. Algorithmic underwriting is also widely used in the property and casualty industry. Innovation in insurance is not limited to the majors as demonstrated by interesting companies such as *Cuvva* which sells automobile insurance through a smartphone app that also evaluates the customer's driving skill and adjusts the premium accordingly. Another is *Hippo* that provides a home insurance quote through its app in sixty seconds, and also offers its clients home security devices such as leak sensors, camera, motion detectors, and smart smoke alarms.

Companies seek to revolutionize *the financial world using clever technology*

What follows is a handful of personal finance applications that are offered by companies seeking to revolutionize the financial world using clever technology. *Prism* is an app that allows the user to view, manage, and pay all of her bills in one place. It also provides context by providing information on income, account balances, and monthly expenses. Similarly, *Mint* provides information on all of the user's cash accounts, credit cards, investments, and bills. It is particularly useful in budgeting and cashflow management. *Personal Capital* offers a comprehensive suite of services including budgeting, cash flow management, retirement planning, education planning, and fee analysis. It also offers a wealth management service similar to the Roboadvisor products that were described above. *Affirm* is attempting to disrupt the credit card industry by offering a product in which the consumer uses a virtual card to make purchases and then pays on a flexible schedule. Interest is not charged for short term repayment periods but is assessed at a 15% annual rate for longer time frames. Finally, the banking industry is being disrupted to some extent by peer-to-peer lending platforms such as *Lending Club, Prosper,* and *Upstart*. These companies connect investors and borrowers to provide smaller loans to individuals and businesses at relatively attractive interest rates.

BLOCK CHAIN/CRYPTO

As mentioned earlier, this area is attracting a great deal of the capital invested in FinTech. Blockchain deserves a separate treatise in that it has application in a huge number of areas including banking, international trade, healthcare, logistics, government, insurance, real estate, and media, among many others. For the purposes of this paper, I cover just one application, crypto currencies or crypto. While crypto is somewhat controversial, it may represent the ultimate example of FinTech in that it is entirely digital and built on blockchain which is a truly novel technology. *Gemini* provides a crypto exchange in which customers can trade in and store more than one hundred different crypto currencies. It also offers a no-fee credit card that earns up to 3% rewards that are actually paid in crypto. *Kraken* and *Coinbase* both offer a broad range of services to investors in crypto and NFTs (Non-fungible tokens) Finally, *Coinme* seeks to make Bitcoin available to all by providing both a mobile app and a network of more than ten thousand physical ATMs.

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RISKS

New technologies are very exciting but surely there must be some risks inherent in all of this! I want this to be an uplifting paper so here are brief descriptions of a few key concerns:

- Many FinTech categories are largely unregulated. This poses risks to consumers and to the FinTech companies themselves if regulators ultimately force changes in their business models.
- Data security-Many applications require a good deal of personal information which can be catastrophic for both customers and companies should there be a data breach.
- Cyberattacks-In the first half of 2022, crypto thefts attributable to hackers amounted to $1.9 billion!
- These applications rely on a complex technology infrastructure that could be vulnerable to nature, foreign hostile powers, and so on.
- There may be unintended biases in underwriting algorithms that discriminate against certain classes of individuals. Biases would be harmful to the affected groups and could result in legal action against insurance companies.
- Fraud, theft and other forms of misconduct on the part of FinTech companies themselves is always a possibility.
- There is intense competition including threats from non-financial companies. (Amazon is moving into a number of financial businesses)

DISRUPTIVE INNOVATION

The late Harvard Business School Professor and author, Clay Christensen, coined the phrase “disruptive innovation” to describe how new market entrants often disrupt established companies forcing them to accelerate innovation to defend their businesses. Financial Services companies may be the poster child for this idea as both new entrants and established companies are battling not only for position but perhaps even for survival. As a result of this battle, all of us will enjoy incredible new products and services, lower cost, and convenience. The financial world is certainly not the first area that comes to mind when thinking about technology. But, financial technology is not an oxymoron and there is indeed a revolution in progress.

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